

SUMMARY REPORT

WITHDRAWAL OF UMETCO FROM NIAGARA FALLS

by

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## 1.0 INTRODUCTION

The Technology Department of Umetco Minerals Corporation was disbanded on March 31, 1985. Many items associated with the closing extended well beyond that date. These included transfer and sale of equipment, disposal of chemicals, termination of radioactive material licenses, reorganizing files, and withdrawal from the Elkem premises.

When Union Carbide subsequently sold the Niagara Plant to Strategic Minerals Corporation an Environmental Agreement was signed on May 13, 1986 in which liabilities were defined and certain reclamation, restoration, and disposal obligations were innumarated.

This report briefly summarizes the work completed in both of these areas. Details are contained in separate files which are presently located in Niagara Falls.

## 2.0 ENVIRONMENTAL ISSUES (NIAGARA FALLS)

Article 3 "Other Environmental Matters" - sections (a) through (l) of the Environmental Agreement (Niagara Falls) between Union Carbide and Strategic Minerals Corporation lists the obligations of Umetco to U. S. Vanadium.

One of these, (Item j), concerns vanadium slags and remelts and is the responsibility of U. S. Vanadium. Item k, dealing with the underground storage tanks is ongoing. U. S. Vanadium has signed letters acknowledging that 7 of the 10 remaining items were completed to their satisfaction. I have been assured that sign-off on another two, Item (a) PCB Transformers and Item (e) Asbestos in Freight Elevator will take place soon. The last one, Item (b) Halide Scrubber will be signed off after the stack discharge permit has been obtained.

More specific information on each of the items follows.

### 2.1 PCB Transformers and Capacitors

Eight transformers and in excess of 100 capacitors that contained PCB's were disposed of in May 1986 under the direction of U. S. Vanadium personnel. At that time, six transformers belonging to U. S. Vanadium and three belonging to Linde Division were retrofilled by UNISON. One of the transformers of U. S. Vanadium is a spare and could not be placed in service for the 90-days required prior to analysis and reclassification. Another failed to come to the required 50°C temperature. Mr. Gary R. Pilcher, Regional Service Manager of UNISON, has written to C. T. Wentzel agreeing to assume responsibility for reclassification at no cost to U. S. Vanadium or Umetco. A letter requesting sign-off was sent to C. T. Wentzel on January 19, 1987. I spoke with him by phone on February 17 at which time he assured me that he saw no problem.

### 2.2 Halide Scrubber

Prior to the sale, returned vanadium halide cylinders were cleaned in the yard and discharged to a sewer. In October 1985 a scheme was proposed to discharge the cylinders to a trough containing water jets that would direct the fumes to an improved scrubber. The cost was estimated to be \$70,000. In October 1986, the completed system in which costs had escalated to \$95,000

was found inadequate. It was necessary to extend a shed so that tanks could be discharged out of the wind. Additional capital was authorized by Mr. F. V. McMillen on October 10, 1986 with a stipulation that Umetco would not pay more than \$118,500. Modifications were completed and the system operated successfully on January 7, 1987.

A letter requesting "sign-off" was written to C. T. Wentzel on January 14. He sent a letter to Messrs. DeAtley and Miller on February 13 informing them that applications for air permits had been mailed to New York State D.E.C. It is my understanding they will sign-off when the permits are obtained.

### 2.3 Chrome Oxide

Fifty-one drums containing approximately 11 tons of vanadium bearing slag that had been contaminated with chrome oxide was disposed of by Chemical Waste Management (SCA Chemical Services) on April 10 and 11, 1986. A copy of the letter acknowledging that U. S. Vanadium was satisfied was mailed to F. V. McMillen on October 27, 1986.

### 2.4 High Antimony Tungsten

On April 2, 1986, approximately 50 tons of tungsten molybdenum oxide contaminated with antimony was disposed of by Chemical Waste Management (SCA Chemical Services). A copy of the letter acknowledging U. S. Vanadium "sign-off" was mailed to F. V. McMillen on October 27, 1986.

### 2.5 Asbestos in Freight Elevator

By the terms of the Environmental Agreement, UCC has "no indemnification obligation to Buyer with respect to --- (iii) any asbestos in the Niagara Falls Facility except as specifically enumerated in paragraph (e) of Article 3--". Paragraph (e) refers only to the removal of the asbestos lining in the Globar elevator. The Union Carbide Corporate Audit Team agreed that asbestos should also be removed from the Old Boiler House, pipelines outside the Old Boiler House, and Building 111 which were not part of the sale to Stratcor. This was an insurance against potential future liability.

The successful bidder was Niagara Insulations, Inc. at \$61,800.

Removal of asbestos from the elevator turned out to be much more complex than anticipated. Niagara Insulations elected to use a high pressure water jet. Unfortunately it was only partially effective and also caused asbestos to be forced through the joints in the corrugated steel walls resulting in contamination outside the elevator. Not only did the job take longer than expected but Niagara Insulations personnel had to be brought back on three occasions because the job was not completed to our satisfaction. The water treatment also removed lubrication from the elevator cable and pulleys and it was necessary to bring in Otis Elevator Company to correct this. However, on the plus side lubricating the cables also served to immobilize any fibers that may have been worked into the cable strands.

The atmosphere within the elevator was sampled by Asteco, Inc. on October 7, 1986 and again on December 11, 1986 to determine the extent of

airborne fibers. On both dates the readings were below the 01 fibers per cubic ft recommended as satisfactory after cleanup by EPA (1)

A letter was sent to C. T. Wentzel December 16 requesting sign-off. However U. S. Vanadium was not satisfied and resampled on February 11, 1987. This time no fibers were found in the sample. C. T. Wentzel told me by phone on February 17 that U. S. Vanadium will sign-off when he receives the written report from Asteco Inc.

## 2.6 "Super Sucker" Dust

"Super Sucker" dust is the material collected by a commercial vacuum cleaner from the rafters at various locations within the Niagara Plant. The contents of the machines are discharged randomly in the yard east of No. 5 Furnace Room. Various piles of this material were sampled by George Parker of U. S. Vanadium and analyzed by Ecology and Environment Inc. in May 1986 for leachable toxic substances. None were found which technically let us off the hook. However, it was decided to remove these materials to a sanitary land fill to avoid any questions in the future. Modern Disposal Services took care of this on August 11, 1986. U. S. Vanadium's letter of acceptance was mailed to F. V. McMillen on October 27, 1986.

## 2.7 Sample Cans

Over the years samples of raw materials, slags and ferroalloys were collected, placed in one quart tins and stored in a caged area in Building 25. Disposal of these presented a problem since the contents had to be identified and then classified as toxic or non-toxic. In addition, numerous samples, notably those from pyrochlores and uranium ores were radioactive. The disposal was begun under the direction of George Parker of U. S. Vanadium and a shipment of non-hazardous material was removed by BFI Waste System in 1985. We assumed responsibility for the remaining 1200 samples in July 1986. There were classified as radioactive, non-hazardous, or toxic and were handled accordingly. The radioactive material was included in a shipment to Barnwell, South Carolina, September 19, 1986. The balance of the samples, after classification, were emptied into 50 gallon drums. The non-toxics were removed by BFI Waste Systems on October 10, 1986; the toxic material by SCA Chemical Services on November 24, 1986. The storage area was thoroughly cleaned and monitored to be assured no radioactive material remained. A letter of acceptance by U. S. Vanadium was mailed to P. K. Willmott on January 14, 1987.

## 2.8 Yard Area - Ores and Slags

A radiation survey and surface sampling were completed in the yard area east and north of the Niagara Plant. The purpose was to determine if hazardous waste was present in this area, in which case Umetco would assume the cost of reclamation, or if not, the surveys could serve as a benchmark for deciding reclamation costs at the termination of U. S. Vanadium operations at Niagara Falls.

- (1) The Department of Labor (OSHA) as of June 20, 1986 will allow 0.2 fibers per cc but requires medical surveillance at 0.1 fibers per cc. The regulation for permissible airborne fibers in the workplace are an order of magnitude higher than that suggested by EPA after cleanup.

Gamma radiation was measured at waist level and at surface contact on a grid laid out on 50-ft. centers. With the exception of one slag pile that was subsequently removed, no anomalies were observed. The survey was completed May 5 and 6, 1986 and reported to F. V. McMillen on May 15.

The surface sampling was completed on April 30, 1986. The area east and north of the Niagara Plant was surveyed and divided into eight parcels of approximately one acre each. Five samples from surface to six inches deep were taken and blended to form a composite sample for each one acre parcel. The samples were submitted to Advanced Environmental Systems Inc. for analyses of PCB's, EP Toxicity Metals, and the 13 Priority Pollutant Metals. All samples were well below permissible levels for PCB's and EP Toxicity. Of the Priority Pollutants, chromium, nickel, zinc, and copper were detected. These have no significance unless the soil is to be removed.

U. S. Vanadium signed off on this item in October 1986.

## 2.9 Plant Buildings

A gamma radiation survey completed in February 1986 uncovered three areas within the plant that had radiation significantly above background. These were an area immediately adjacent to No. 30 Furnace in Building 29, a pit in Building 24 (VAI), and a slag pile east of Building 29. This discovery caused some concern because we had been actively trying to terminate our radioactive material licenses for over a year. Mr. R. Kelly of the State of New York - Department of Labor, was informed and later met with Bob Beverly and me to decide on the proper course of action.

We discovered that New York State is more lenient than NRC on defining allowable concentrations of natural occurring radioactivity (500  $\mu$ g/g of combined U + Th and radiation less than 250  $\mu$ R at surface). The contaminated illmenite in the pit in Building 24 and the slag in the yard area contained less than this limit. However, Dr. F. J. Bradley, Principle Radiophysicist of the New York Department of Labor suggested it would be wise to remove the material to a waste site to avoid riders on the lease of the property.

Subsequently, nineteen 55-gallon drums of radioactive soil and slag from No. 30 Furnace were shipped to Barnwell Waste Management Facility, SC by Chem Nuclear Systems on September 19, 1986. The 125 drums of low level radioactive illmenite from Building 24 and the 75 tons of low level radioactive slag were disposed of by Chemical Waste Management (SCA) on June 18, 19 and 20. The areas adjacent to No. 30 Furnace and the pit in Building 24 were backfilled with crushed stone by Dube Construction Company.

U. S. Vanadium signed the letter of acknowledgement in October 1986.

## 2.10 Drain and Level Lake

A low area east of the Niagara Plant on the property line between L-Tec and U. S. Vanadium collected rain water and discharge from L-Tec forming a sizeable artificial pond sometimes referred to as "Lake Linde". After consultation between personnel from Linde, L-Tec, and Umetco it was decided to take remedial action. The north end of the pond was drained by L-Tec in April 1986.

The final draining and grading was completed by Dube Construction on August 22, 1986. Several truckloads of clay from Elkem property was used as fill. This material had been used as a temporary cap over an area that had been excavated to remove radioactive soil. Samples of the clay were obtained by Advanced Environmental Systems and analyzed for leachable EP Toxicity Metals. The samples were then forwarded to the Linde Division R&D Analytical Services for radio-assays. There were no leachable toxic metals and the radioactivity was barely above background.

Polaroid snapshots of the graded area were submitted as part of the record.

U. S. Vanadium signed off on this item in October 1986.

### 3.0 CLOSING OF THE TECHNOLOGY DEPARTMENT

#### 3.1 Transfer and Sale of Equipment and Furniture

When the disbanding of the Technology Department was announced all the laboratory equipment at Niagara Falls (and Grand Junction) became surplus. The equipment lists that had been prepared for the "Tiger" project were circulated to the Niagara, Hot Springs and Bishop Plants. Equipment was shipped on request on a "first come - first served" basis. The Hot Springs Plant was the most aggressive receiving about 90% of the Grand Junction analytical laboratory equipment plus two large shipments from Niagara Falls.

The balance of the sale was placed in the hands of Investment Recovery. Their first order of priority was to offer surplus equipment to other divisions of Union Carbide. Roy Sommers visited the Technology facility and prepared a booklet listing those items he thought would move quickly. Closing Date for request was set as October 15, 1985.

The response within the Corporation was good. Eighteen locations made requests and equipment with an initial value of \$139,852 was transferred.

Elkem Metals was given first choice when sales were opened up outside the Corporation. They purchased considerable equipment to which was assigned an \$11,190 price tag.

The choice office furniture, i.e. that constructed of wood, both from R&D and Engineering went to the Linde Divisions located next door.

Most of the equipment and furniture remaining was moved to the vacant "Old Works Lab", (Building 111) prior to the termination of our lease with Elkem December 31, 1985. Some of the heavier pieces were stored in garages near the Engineering Building. Furniture and partitions from Engineering (Building 149) were also stored in Building 11 when that facility was turned over to Linde Division.

Investment Recovery invited several used equipment dealers to bid on what was left. Representatives from two firms, BoChem and J. Little Mercer sent representatives to view the equipment. BoChem submitted a bid of \$1750 which was turned down.

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ENVIRONMENTAL AGREEMENT (Niagara Falls)

AGREEMENT made as of this 13<sup>th</sup> day of May, 1986, by and among Union Carbide Corporation, a New York corporation having an office at 39 Old Ridgebury Road, Danbury, Connecticut 06817-0001 ("Union Carbide"), Umetco Minerals Corporation, a Delaware corporation having an office at 39 Old Ridgebury Road, Danbury, Connecticut 06817-0001 ("Umetco") (Union Carbide and Umetco being hereafter collectively called "Seller") and U. S. Vanadium Corporation, a Delaware corporation, with a mailing address c/o Strategic Minerals Corporation, 30 Main Street, Danbury, Connecticut 06810 ("USV") and Strategic Minerals Corporation, a Connecticut corporation having an office at 30 Main Street, Danbury, Connecticut 06810 ("Stratcor") (USV and Stratcor being hereafter collectively called "Buyer").

WITNESSETH

WHEREAS, USV has acquired substantially all the assets of Umetco's U.S. vanadium business pursuant to a Purchase Agreement among Union Carbide, Umetco and Stratcor dated as of April 23, 1986 (the "Purchase Agreement"); and

WHEREAS, the parties desire to provide for certain services to be rendered, work to be done and liabilities to be assumed with respect to Umetco's vanadium and tungsten products processing facility located at Niagara Falls, New York (the "Niagara Falls Facility"), and



WHEREAS, pursuant to the Purchase Agreement, Seller will be transferring to USV all of the environmental permits, licenses and approvals ("Environmental Permits") as identified in Schedule 9 of Exhibit Q to the Purchase Agreement; and

WHEREAS, Seller and Buyer acknowledge that USV will require a reasonable amount of time after the closing of the Purchase Agreement in order to accomplish a prompt transfer of the Environmental Permits,

NOW, THEREFORE, the parties hereto hereby agree as follows

1. Indemnification.

(a) Subject to the provisions of Articles 3 and 7 below, Seller hereby assumes and will be liable for, and shall indemnify Buyer against and hold Buyer harmless from, any and all costs, claims, damages, lawsuits, attorneys' fees, losses, deficiencies, judgments, actions, liabilities and obligations of any kind or description (collectively called "Claims") asserted against, incurred or required to be paid by Buyer (regardless of when asserted or by whom), resulting from Seller's business operations at the Niagara Falls Facility prior to the date of this Agreement. Seller's obligation hereunder is limited to the Claims and Seller shall have no liability whatsoever for incidental or consequential damages to USV.

(b) USV hereby assumes and will be liable for, and shall indemnify Seller against and hold Seller harmless

from any and all Claims asserted against, incurred or required to be paid by Seller (regardless of when asserted or by whom), resulting from USV's business operations at the Niagara Falls Facility from and after the date of this Agreement. USV's obligation hereunder is limited to the Claims and USV shall have no liability whatsoever for incidental or consequential damages to Seller.

(c) Notwithstanding the provisions of paragraph (a) above, but subject to the provisions of paragraph (f) below, Buyer agrees that Seller shall have no further indemnification obligation to Buyer with respect to the reclamation, restoration, testing and/or disposal activities and obligations as set forth in paragraphs (a), (b), (c), (d), (e), (f), (g), (h) and (i) of Article 3, but only upon completion of such reclamation, restoration, testing and/or disposal activities or satisfaction of such obligations by Umetco. Upon request from Seller, Buyer will deliver to Seller a written release confirming the cessation and termination of indemnification contemplated in this Article 1, such release to be in form and substance satisfactory to Seller's counsel.

(d) Buyer further agrees that Seller shall have no indemnification obligation to Buyer with respect to

(1) any PCBs in oil filled switches in the  
Niagara Falls Facility.

(ii) PCBs in capacitors, transformers, oil supplies or in any other areas of the Niagara Falls Facility, except as specifically enumerated in paragraph (a) of Article 3 below.

(iii) any asbestos in the Niagara Falls Facility except as specifically enumerated in paragraph (e) of Article 3 below.

(e) Upon termination of production of products at the Niagara Falls Facility, Buyer and Seller agree to share any final restoration, reclamation or remediation costs required by applicable laws relating to the plant site (provided that any saleable/salvageable assets in the plant will be sold and the proceeds applied to total reclamation liabilities) and any other areas not specifically enumerated in this agreement in proportion to their respective periods of occupancy of the Niagara Falls Facility. Buyer's share of such costs (including costs referred to in paragraph (h) of Article 3 below) shall in no event exceed its period of occupancy of the Niagara Falls Facility (expressed as a percentage) multiplied by \$1,000,000. (The parties acknowledge that Seller conducted operations at the Niagara Falls Facility from 1919 to 1986.)

(f) Buyer and Seller agree to assert no claims of any kind against each other as a result of Seller's, its contractors' or consultants', or Buyer's performance of or supervision of the Work (as hereinafter defined) except in the

event of the gross negligence or willful misconduct of the other party.

(g) Notwithstanding the provisions of paragraph (c) above, Seller's indemnification obligation set forth in paragraph (a) above shall not cease and terminate in the event the Niagara Falls Facility is listed as a "Superfund" site pursuant to the Comprehensive Environmental Response, Compensation and Liability Act.

2. Indemnification Procedure, Right to Contest Reclamation Requirements.

(a) Buyer shall notify Seller within 45 days from the assertion of any Claim or discovery of any fact upon which Buyer intends to base a claim for indemnification hereunder. Buyer's failure to so notify Seller shall relieve Seller from any liability under this Agreement to Buyer with respect to such Claim. Seller shall have the right at its own expense to participate jointly with Buyer in the defense of any claim, demand, lawsuit or other proceeding in connection with which Buyer claims indemnification hereunder and, with respect to any issue involved in such claim, demand, lawsuit or other proceeding as to which Seller shall have acknowledged the obligation to indemnify Buyer hereunder, Seller shall have the sole right to settle or otherwise dispose of such claim, demand, lawsuit or other proceeding on such terms as Seller, in its sole discretion, shall deem appropriate.

(b) Seller shall notify Buyer within 45 days from the assertion of any Claim or discovery of any fact upon which Seller intends to base a claim for indemnification hereunder. Seller's failure to so notify Buyer shall relieve Buyer from any liability under this Agreement to Seller with respect to such Claim. Buyer shall have the right at its own expense to participate jointly with Seller in the defense of any claim, demand, lawsuit or other proceeding in connection with which Seller claims indemnification hereunder and, with respect to any issue involved in such claim, demand, lawsuit or other proceeding as to which Buyer shall have acknowledged the obligation to indemnify Seller hereunder, Buyer shall have the sole right to settle or otherwise dispose of such claim, demand, lawsuit or other proceeding on such terms as Buyer, in its sole discretion, shall deem appropriate.

(c) Seller and Buyer shall each retain the right to contest any restoration, reclamation or remediation requirements imposed by State or other environmental authorities having jurisdiction over the Niagara Falls Facility.

### 3. Other Environmental Matters.

(a) PCB Transformers and Capacitors. Umetco agrees to assume the cost of retrofilling, replacing or disposing of the following capacitors and transformers as promptly as feasible

<u>Item</u>	<u>Action</u>
Transformers 5, 21, 22, 33, 34, 35, 110, 111, 143	Retrofill
Transformers 4, 23, 24, 122, 159, 160 and 161	Dispose
Transformer 119	Dispose & Replace
86 Capacitors for #32 furnace	Dispose
27 Miscellaneous Capacitors	Dispose
Shaft Furnace Capacitors	Dispose

Umetco further agrees to assume the cost of cleanup and disposal of PCB contaminated sludges, oils, waste material currently on site or that will be accumulated when the above equipment is retrofilled or removed. Specifically, Umetco assumes the cost of cleanup and disposal of PCB contaminated soil under the "Owl" transformers, i.e., Nos. 159, 160, and 161, if necessary. ("Retrofilling" is defined as replacing, flushing, etc., of PCB contaminated oils, which when refilled and after the required test runs under power, test at less than 50 ppm PCBS.)

(b) Halide Scrubber. Umetco further agrees to assume the cost of completing installation after the date of this agreement of the halide scrubber now being installed and any corrective modifications to insure compliance with applicable regulations. Once completed and operating as now designed, USV

accepts responsibility for obtaining necessary permits for the system.

(c) Chrome Oxide. Umetco further agrees to assume the cost of disposal of 64 drums of chrome oxide now located at the Niagara Falls Facility.

(d) High Antimony Tungsten. Umetco further agrees to assume the cost of disposal of approximately 100,000 pounds of high antimony tungsten molybdenum oxide now located at the Niagara Falls Facility.

(e) Asbestos in Freight Elevator. Umetco further agrees to assume the cost of removal of the asbestos lining in the global elevator.

(f) "Super Sucker" Dust. Umetco further agrees to test the various waste piles of plant dust deposited by the "Super Sucker" industrial cleaning firm in the plant yard to determine whether such piles are Hazardous Waste (as defined in the Resource Conservation Recovery Act or comparable state law). If any such piles are determined to be Hazardous Waste, under applicable laws, Umetco agrees to assume the cost of removal and disposal of such piles.

(g) Sample Cans. Umetco further agrees to assume the cost of removal and disposal of the numerous small sample cans in the global area.

(h) Yard Area Ores and Slags. Umetco further agrees to conduct a radiation survey and surface sampling program of

the plant yard area to determine whether or not Hazardous Waste is present in the yard area. If Hazardous Waste is found, Umetco agrees to assume the cost of reclamation or remediation of the plant site or disposal of such Hazardous Waste, as required by applicable law. At termination of USV's operations at the Niagara Falls Facility, Buyer and Seller agree to share the cost of reclamation of the plant yard area in the same proportions and with the limitation on Buyer's obligation specified in paragraph (e) of Article 1 above, unless USV's operations at said facility have created a materially more expensive reclamation problem (when compared with reclamation based upon an assumed continuation of operations as conducted in the past by Seller and using the results of the radiation survey and surface sampling program as a benchmark), in which event the excess plant yard reclamation costs will be borne by Buyer.

(i) Plant Buildings. Umetco further agrees to assume the cost of decontaminating the three areas of the plant which have been determined to be radioactive based upon Umetco's radiation survey of the plant.

(j) Miscellaneous Slags and Re-Melts in Yard Area. Buyer agrees to assume the cost of disposal, if required, of 20,000 pounds of vanadium aluminum remelts, 4,000 tons of miscellaneous slags from various furnace operations, piles of



lime, etc. in the plant yard area, and empty drums around the plant and all other miscellaneous materials currently on the plant site and not specifically enumerated in paragraphs (a) through (i) above.

(k) Storage Tanks. If in the future USV is required by law to modify, repair or remove the underground gasoline and/or waste oil storage tanks due to evidence of leaking, Seller and Buyer agree to share the cost of modification, repair or removal based upon their respective periods of occupancy of the Niagara Falls Facility, except if such modification, repair or removal is due solely to the business operations of USV, in which event USV shall solely bear such cost.

(l) Appropriate remedial action will be taken with respect to the pond on the eastern boundary of the Niagara Falls Facility.

4. Environmental Work and Access to Premises.

Seller and Buyer have agreed upon a program of work affecting the environment, including, but not limited to, reclamation, restoration, remediation and cleanup, as described in Articles 1 and 3 above, to be performed at the Niagara Falls Facility (hereafter the "Work") by and under the supervision of Seller and at Seller's sole cost and expense. A plan for the Work, including estimated costs of performing various aspects

thereof and estimated time schedules for completing the Work, is attached hereto as Schedule A. Seller agrees to supervise the performance of the Work and covenants that the Work will be performed in a good and workmanlike manner, and in compliance with applicable laws (or, in the absence of such laws, in accordance with generally accepted environmental engineering standards). USV hereby grants to Seller, its contractors and consultants, the right and license to enter the Niagara Falls Facility for the purpose of supervising and performing the Work. Seller agrees, for itself, its contractors and consultants, to exercise such right and license so as to minimize any interference with or disruption of USV's normal commercial operations at the Niagara Falls Facility.

5. Coordination Committee, USV Performance of the Work.

(a) USV and Umetco will each designate two (2) representatives to serve on a Coordination Committee which will oversee the performance of the Work with the goal of assuring completion of the Work in a timely and cost-effective manner, with minimal interference with USV's normal commercial operations at the Niagara Falls Facility.

(b) Upon Umetco's reasonable request, USV will perform all or any portion of the Work described in Schedule A, in a good and workmanlike manner. Umetco shall pay USV monthly

upon receipt of invoice for USV's actual costs of performing the Work (or otherwise agreed contract price).

6. Cost Verification.

USV's books and records will be open to inspection by Umetco upon reasonable notice and during normal business hours, but not more than once every six (6) months, for the purpose of verifying USV's costs of performing the Work.

7. Bridging of Environmental Permits.

(a) To the extent that applicable federal, state or local statute, law, regulation, rule or order requires action to be taken by or on the part of Seller in order for USV to obtain a Transfer of the Environmental Permits, Seller shall take or cause to be taken all such action, and Seller otherwise shall cooperate with USV in obtaining such Transfer. As used in this Article 7, a "Transfer" of Environmental Permits shall mean and include, as applicable, the substitution of USV's name on, and a transfer, reissuance or new issuance to USV of, such Environmental Permits, without any continuing obligation or liability of Seller whatsoever, including, without limitation, as a guarantor or surety thereof.

(b) From and after the closing of the Purchase Agreement, Seller shall maintain, at Buyer's sole cost and expense pursuant to Paragraph (c) below, each of the

Environmental Permits, including all bonds, guarantees or other financial sureties relating thereto or required thereby ("Sureties") until the earlier of (i) expiration of each such Environmental Permit (it being acknowledged that Seller shall have no obligation to renew any Environmental Permit hereunder) or (ii) Transfer of each such Environmental Permit, provided, that during such time USV diligently shall use its best efforts to obtain a Transfer of the Environmental Permits and to obtain any Sureties related to or required by such Environmental Permits. In connection therewith, USV, as promptly as possible, but in no event later than one (1) month after the date of this agreement, shall submit to or file with the appropriate governmental or regulatory authorities, in a complete fashion, all applications and other documents required to be so submitted or filed by USV in order to obtain a Transfer of the Environmental Permits, provided, that such time limitation shall be extended with respect to each applicable Environmental Permit by such period of time that any failure by USV to comply therewith is attributable to action or inaction by or on the part of Seller. Upon either expiration or Transfer of each Environmental Permit as described in subparagraphs (b)(i) or (b)(ii) above, USV's obligation to reimburse Seller for such maintenance of that Environmental Permit shall cease and Seller shall have the right to cancel such Environmental Permit and/or Surety, to the extent such

cancellation is permitted by law. USV promptly shall notify Seller of the Transfer of each Environmental Permit and Seller promptly shall notify USV of any change in the previously scheduled expiration of any Environmental Permit and of any change in the provisions of each Environmental Permit.

(c) Except with respect to any net income taxes payable by Union Carbide, the maintenance of the Environmental Permits and/or Sureties as described in Paragraph (b) above shall be absolutely net to Seller, and Buyer shall reimburse Seller for all direct costs and expenses incurred by Seller in connection with such maintenance; provided, that Seller shall provide USV with such documentation as USV reasonably may request in order to verify the amount of such maintenance costs and expenses. Seller shall invoice USV for all amounts payable hereunder and payment shall be due net thirty (30) days from the date of invoice. If USV fails to make any payment to Seller hereunder when due with respect to any such Environmental Permit, then Seller shall have the right to terminate this agreement with respect to such Environmental Permit if USV does not cure such default within twenty (20) days after notice thereof from Seller.

(d) Prior to Transfer of the Environmental Permits, Buyer shall cooperate with Seller and provide whatever information is needed and perform whatever actions are

necessary to comply with the Environmental Permits in a manner consistent with Seller's past policies and in compliance with the terms and conditions of the Environmental Permits. If USV shall fail to comply with any material term or condition of any Environmental Permit or breach any commitment, agreement or obligation under this agreement, then Seller shall have the right to terminate this agreement with respect to such Environmental Permit if USV does not cease and, if necessary, cure any such noncompliance or breach as soon as practicable but in no event later than twenty (20) days after notice thereof from Seller or within any shorter time period as required by any governmental or regulatory authority, provided, however, that if in Seller's sole good faith judgment any such noncompliance or breach creates, contributes to, or results in, or is likely to create, contribute to, or result in, an emergency situation, Seller may immediately suspend USV's operations under applicable Environmental Permits until such emergency situation or potential emergency situation has ceased, and, if necessary, has been cured. Notwithstanding anything to the contrary contained in the foregoing, Seller shall not terminate this agreement or suspend USV's operations under any Environmental Permit based solely upon (i) noncompliance with the transfer provisions of any Environmental Permit or (ii) any breach of this agreement based solely upon

noncompliance with such transfer provisions unless an applicable federal, state or local government or regulatory authority issues an order or notice of violation that USV's operations under such Environmental Permit is in violation of its transfer provisions and indicates that it will or may take remedial action against Seller as a result thereof. Seller shall promptly notify USV of the termination or suspension of USV's operations under any Environmental Permit under this Paragraph (d) and the reasons therefor.

(e) Buyer shall indemnify Seller against and hold Seller harmless from all claims, damages, losses, liabilities, demands, assessments, fines, penalties, administrative orders, notices of violation, suits, actions or proceedings, costs, expenses and obligations, including interest, penalties and reasonable attorneys' fees (collectively, "Claims"), which arise out of or in connection with (i) USV's failure during the applicable period set forth in paragraph (b) above to comply with the terms and conditions of any Environmental Permit, or the statutes, laws, regulations, rules, orders or codes pertaining thereto or (ii) any breach of any commitment, agreement or obligation by USV under this agreement; provided, however, that USV shall not be obligated to indemnify Seller against any Claims arising solely out of or in connection with any failure by Seller to comply with applicable transfer

provisions of the Environmental Permits. These indemnification provisions relate to this Agreement and shall be in addition to, and not in derogation of, the respective rights, obligations, liabilities and indemnifications of Seller and Stratcor pursuant to the Purchase Agreement.

8. Headings.

Article headings are not to be considered a part of this Agreement, are included solely for convenience, and are not intended to be full of accurate descriptions of the contents thereof.

9. Governing Law.

This Agreement shall be construed in accordance with and governed by the laws of the State of Connecticut.

10. Notices.

Any notice or other communication required or permitted hereunder shall be in writing, and shall be deemed to have been given if placed in the United States mail, registered or certified, postage prepaid, addressed as follows

If to Seller, addressed c/o Union Carbide  
as follows.

39 Old Ridgebury Road  
Danbury, Connecticut 06817  
Attention. President, Umetco Minerals Corporation



If to Buyer:

Strategic Minerals Corporation  
30 Main Street  
Danbury, Connecticut 06810

with a copy to

Gager, Henry & Narkis  
30 Main Street  
Danbury, Connecticut 06810  
Attention: David R. Chipman, Esq.

Each of the foregoing shall be entitled to specify a different address by giving notice as aforesaid to the others.

11. Disputes. Any dispute that the parties are unable to resolve may be submitted to any court having jurisdiction over such dispute.

12. Entire Agreement, Survival, No Waiver.

This Agreement and the other documents and instruments contemplated hereby or thereby constitute the entire agreement between the parties pertaining to the subject matter hereof, and supersede all prior and contemporaneous agreements, understandings, negotiations and discussions, whether oral or written, of the parties, and there are no warranties, representations or other agreements between the parties in connection with the subject matter hereof, except as specifically set forth herein. No supplement, modification, waiver or termination of this Agreement shall be binding unless executed in writing by the party to be bound thereby. No

waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provision hereof (whether or not similar), nor shall such waiver constitute a continuing waiver unless otherwise expressly provided herein.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be entered into and executed by their officers thereunto duly authorized as of the date and year hereinabove set forth.

UNION CARBIDE CORPORATION

By: [Signature] <sup>CM</sup>  
Title: President, Sales and Services

UMETCO MINERALS CORPORATION

By: [Signature] <sup>CM</sup>  
Title: President

STRATEGIC MINERALS CORPORATION

By: [Signature]  
Title: President

U.S. VANADIUM CORPORATION

By: [Signature]  
Title: President

Schedule A

Niagara Falls, New York

Description of Work

<u>Work to be Done</u>	<u>Established Completion Date</u>
A. Replace, retrofill or dispose of PCB containing transformers, capacitors and dispose of cleanup materials.	8/86
B Complete halide scrubber.	8/86
C Dispose of chrome oxide	6/86
D Remove global elevator asbestos.	8/86
E Dispose of high antimony tungsten	10/86
F Dispose of sample cans.	10/86
G Sample, test and dispose of, if necessary, "Super-sucker" dust	10/86
H Yard area sampling and cleanup, if necessary.	3/87
I Drain and fill "Lake Linde"	6/87
J Clean up radioactive areas of plant.	6/87



## Elkem Metals Company

Technology Center  
4625 Royal Avenue P.O. Box 1344, Niagara Falls, NY 14302  
(716) 286-7400  
Telex II 710-524-1664

RECEIVED  
JUN 23 1986  
D J HANSEN

June 23, 1986

Dr. D. J. Hansen  
Umetco Minerals Corporation  
137 - 47th Street  
Niagara Falls, NY 14302

Dear Don

Subject Divestiture - Niagara Site

Following our conversation on Friday, June 20, 1986, I have reviewed the items of concern that Elkem has which have fed back to Union Carbide through Umetco in the past. With the possibility of you not being available on a regular basis after June 30, 1986, there should be a record of these active items for later resolution. Consider the following

1. Elkem Site - Radioactive Licenses

Your letter to Frank McMillen of March 3, 1986 indicated the action being taken. On License 210-0090 relating to portable isotope analyzers and thorium bearing chemicals, all of these items have been removed and wipe tests have been made in 166 Building. We have not seen the results of these wipe tests. These areas in 166 Building are not presently in use so the timing of delicensing is not critical.

On License 950-0139 relating to the south property on the Elkem site, it is my understanding that the Elkem property cannot be delicensed until contaminated sites (C4P, Main Plant) on the former Umetco property are sampled and cleared.

Elkem's concern is with the clay backfill that Bob Klotzbach authorized for the formerly contaminated areas between the paved storage pads on Elkem's south property. Don Gregory of Elkem's Engineering Department had specified gravel backfill for pad access. Klotzbach proceeded with clay backfill as an expedient to meet sampling target dates. The areas in question cannot support a truck or towmotor in wet weather when the clay softens.

Elkem is anxious to accomplish the following:

- a. Delicense for non-restricted use. This would include excavation for underground utilities or footings for structures.
- b. Excavation of the clay to a reasonable depth (2 feet?) and backfill with a compacted gravel that could support surface traffic.

UCCNHT0000038

## 2. PCB Transformers

The three transformers on the roof of 94 Building continue to be a threat to personnel and continued operation of the building below should a spill or fire occur or a transformer tank breach due to corrosion or impact. Eventually there will be more restrictive federal regulations that could dictate alteration or removal of this power supply.

Although UCC has judged the problem not to be theirs, Elkem does not agree that by leasing the facilities the PCB legacy becomes merely a maintenance problem for Elkem to handle.

The old adage - if it isn't broken don't fix it, does not apply here since the consequences of an oil leak into the building could lead to very serious loss. We will be in pursuit of a solution to this problem with UCC in the near future.

## 3. Holcomb Road Sewer

There is a twofold problem here:

- a. When the Holcomb Road sewer was plugged and abandoned south of 166 Building in the mid 1970's, the sewer plug did not prevent infiltration from the A Street area. Elkem's best judgement is that organic infiltration from this area to the south is the source of present compliance problems.
- b. Subsidence adjacent to the sewer and Building 94 could be an indication of subsurface erosion similar to the situation proceeding the sewer collapse in the same area in the early 1960's.

The City is aware of both of these problems and we are working toward a solution. Elkem feels the liability sequence in the event of an incident would be 1st City of Niagara Falls, 2nd Union Carbide, 3rd Elkem Metals Company.

## 4. 99 Building

This U.S. Vanadium building, on the Elkem side, has created a number of problems for Elkem relating to steam use, sewer contaminations, uncontrolled release of chlorine and use of outside storage areas. Elkem is making efforts now to redefine some of these problems use areas, which presumably would be between Elkem and U.S. Vanadium.

## 5. Utility Use

Fees for using utilities, mostly power and steam, are too high for continued economic operation. Negotiations for reduction will proceed through the Linde Bulk Gas representatives now handling utilities.

## 6. Asbestos Decontamination

Umetco has completed the asbestos decontamination program in 169 and 166 Buildings to Elkem's satisfaction as detailed in your letter of January 30, 1986.

7.26

ENVIRONMENTAL AGREEMENT (Niagara Falls)

AGREEMENT made as of this 13<sup>th</sup> day of May, 1986, by and among Union Carbide Corporation, a New York corporation having an office at 39 Old Ridgebury Road, Danbury, Connecticut 06817-0001 ("Union Carbide"), Umetco Minerals Corporation, a Delaware corporation having an office at 39 Old Ridgebury Road, Danbury, Connecticut 06817-0001 ("Umetco") (Union Carbide and Umetco being hereafter collectively called "Seller") and U. S. Vanadium Corporation, a Delaware corporation, with a mailing address c/o Strategic Minerals Corporation, 30 Main Street, Danbury, Connecticut 06810 ("USV") and Strategic Minerals Corporation, a Connecticut corporation having an office at 30 Main Street, Danbury, Connecticut 06810 ("Stratcor") (USV and Stratcor being hereafter collectively called "Buyer").

WITNESSETH

WHEREAS, USV has acquired substantially all the assets of Umetco's U.S. vanadium business pursuant to a Purchase Agreement among Union Carbide, Umetco and Stratcor dated as of April 23, 1986 (the "Purchase Agreement"), and

WHEREAS, the parties desire to provide for certain services to be rendered, work to be done and liabilities to be assumed with respect to Umetco's vanadium and tungsten products processing facility located at Niagara Falls, New York (the "Niagara Falls Facility"), and

WHEREAS, pursuant to the Purchase Agreement, Seller will be transferring to USV all of the environmental permits, licenses and approvals ("Environmental Permits") as identified in Schedule 9 of Exhibit Q to the Purchase Agreement; and

WHEREAS, Seller and Buyer acknowledge that USV will require a reasonable amount of time after the closing of the Purchase Agreement in order to accomplish a prompt transfer of the Environmental Permits,

NOW, THEREFORE, the parties hereto hereby agree as follows

1. Indemnification.

(a) Subject to the provisions of Articles 3 and 7 below, Seller hereby assumes and will be liable for, and shall indemnify Buyer against and hold Buyer harmless from, any and all costs, claims, damages, lawsuits, attorneys' fees, losses, deficiencies, judgments, actions, liabilities and obligations of any kind or description (collectively called "Claims") asserted against, incurred or required to be paid by Buyer (regardless of when asserted or by whom), resulting from Seller's business operations at the Niagara Falls Facility prior to the date of this Agreement. Seller's obligation hereunder is limited to the Claims and Seller shall have no liability whatsoever for incidental or consequential damages to USV.

(b) USV hereby assumes and will be liable for, and shall indemnify Seller against and hold Seller harmless

from any and all Claims asserted against, incurred or required to be paid by Seller (regardless of when asserted or by whom), resulting from USV's business operations at the Niagara Falls Facility from and after the date of this Agreement. USV's obligation hereunder is limited to the Claims and USV shall have no liability whatsoever for incidental or consequential damages to Seller.

(c) Notwithstanding the provisions of paragraph (a) above, but subject to the provisions of paragraph (f) below, Buyer agrees that Seller shall have no further indemnification obligation to Buyer with respect to the reclamation, restoration, testing and/or disposal activities and obligations as set forth in paragraphs (a), (b), (c), (d), (e), (f), (g), (h) and (i) of Article 3, but only upon completion of such reclamation, restoration, testing and/or disposal activities or satisfaction of such obligations by Umetco. Upon request from Seller, Buyer will deliver to Seller a written release confirming the cessation and termination of indemnification contemplated in this Article 1, such release to be in form and substance satisfactory to Seller's counsel.

(d) Buyer further agrees that Seller shall have no indemnification obligation to Buyer with respect to

(i) any PCBs in oil filled switches in the  
Niagara Falls Facility.



(ii) PCBs in capacitors, transformers, oil supplies or in any other areas of the Niagara Falls Facility, except as specifically enumerated in paragraph (a) of Article 3 below.

(iii) any asbestos in the Niagara Falls Facility except as specifically enumerated in paragraph (e) of Article 3 below.

(e) Upon termination of production of products at the Niagara Falls Facility, Buyer and Seller agree to share any final restoration, reclamation or remediation costs required by applicable laws relating to the plant site (provided that any saleable/salvageable assets in the plant will be sold and the proceeds applied to total reclamation liabilities) and any other areas not specifically enumerated in this agreement in proportion to their respective periods of occupancy of the Niagara Falls Facility. Buyer's share of such costs (including costs referred to in paragraph (h) of Article 3 below) shall in no event exceed its period of occupancy of the Niagara Falls Facility (expressed as a percentage) multiplied by \$1,000,000. (The parties acknowledge that Seller conducted operations at the Niagara Falls Facility from 1919 to 1986.)

(f) Buyer and Seller agree to assert no claims of any kind against each other as a result of Seller's, its contractors' or consultants', or Buyer's performance of or supervision of the Work (as hereinafter defined) except in the

event of the gross negligence or willful misconduct of the other party.

(g) Notwithstanding the provisions of paragraph (c) above, Seller's indemnification obligation set forth in paragraph (a) above shall not cease and terminate in the event the Niagara Falls Facility is listed as a "Superfund" site pursuant to the Comprehensive Environmental Response, Compensation and Liability Act.

2. Indemnification Procedure, Right to Contest Reclamation Requirements.

(a) Buyer shall notify Seller within 45 days from the assertion of any Claim or discovery of any fact upon which Buyer intends to base a claim for indemnification hereunder. Buyer's failure to so notify Seller shall relieve Seller from any liability under this Agreement to Buyer with respect to such Claim. Seller shall have the right at its own expense to participate jointly with Buyer in the defense of any claim, demand, lawsuit or other proceeding in connection with which Buyer claims indemnification hereunder and, with respect to any issue involved in such claim, demand, lawsuit or other proceeding as to which Seller shall have acknowledged the obligation to indemnify Buyer hereunder, Seller shall have the sole right to settle or otherwise dispose of such claim, demand, lawsuit or other proceeding on such terms as Seller, in its sole discretion, shall deem appropriate.

(b) Seller shall notify Buyer within 45 days from the assertion of any Claim or discovery of any fact upon which Seller intends to base a claim for indemnification hereunder. Seller's failure to so notify Buyer shall relieve Buyer from any liability under this Agreement to Seller with respect to such Claim. Buyer shall have the right at its own expense to participate jointly with Seller in the defense of any claim, demand, lawsuit or other proceeding in connection with which Seller claims indemnification hereunder and, with respect to any issue involved in such claim, demand, lawsuit or other proceeding as to which Buyer shall have acknowledged the obligation to indemnify Seller hereunder, Buyer shall have the sole right to settle or otherwise dispose of such claim, demand, lawsuit or other proceeding on such terms as Buyer, in its sole discretion, shall deem appropriate.

(c) Seller and Buyer shall each retain the right to contest any restoration, reclamation or remediation requirements imposed by State or other environmental authorities having jurisdiction over the Niagara Falls Facility.

### 3. Other Environmental Matters.

(a) PCB Transformers and Capacitors. Umetco agrees to assume the cost of retrofilling, replacing or disposing of the following capacitors and transformers as promptly as feasible

<u>Item</u>	<u>Action</u>
Transformers 5, 21, 22, 33, 34, 35, 110, 111, 143	Retrofill
Transformers 4, 23, 24, 122, 159, 160 and 161	Dispose
Transformer 119	Dispose & Replace
86 Capacitors for #32 furnace	Dispose
27 Miscellaneous Capacitors	Dispose
Shaft Furnace Capacitors	Dispose

Umetco further agrees to assume the cost of cleanup and disposal of PCB contaminated sludges, oils, waste material currently on site or that will be accumulated when the above equipment is retrofilled or removed. Specifically, Umetco assumes the cost of cleanup and disposal of PCB contaminated soil under the "Owl" transformers, i.e., Nos. 159, 160, and 161, if necessary. ("Retrofilling" is defined as replacing, flushing, etc., of PCB contaminated oils, which when refilled and after the required test runs under power, test at less than 50 ppm PCBS.)

(b) Halide Scrubber. Umetco further agrees to assume the cost of completing installation after the date of this agreement of the halide scrubber now being installed and any corrective modifications to insure compliance with applicable regulations. Once completed and operating as now designed, USV

accepts responsibility for obtaining necessary permits for the system.

(c) Chrome Oxide. Umetco further agrees to assume the cost of disposal of 64 drums of chrome oxide now located at the Niagara Falls Facility.

(d) High Antimony Tungsten. Umetco further agrees to assume the cost of disposal of approximately 100,000 pounds of high antimony tungsten molybdenum oxide now located at the Niagara Falls Facility.

(e) Asbestos in Freight Elevator. Umetco further agrees to assume the cost of removal of the asbestos lining in the global elevator.

(f) "Super Sucker" Dust. Umetco further agrees to test the various waste piles of plant dust deposited by the "Super Sucker" industrial cleaning firm in the plant yard to determine whether such piles are Hazardous Waste (as defined in the Resource Conservation Recovery Act or comparable state law). If any such piles are determined to be Hazardous Waste, under applicable laws, Umetco agrees to assume the cost of removal and disposal of such piles.

(g) Sample Cans. Umetco further agrees to assume the cost of removal and disposal of the numerous small sample cans in the global area.

(h) Yard Area Ores and Slags. Umetco further agrees to conduct a radiation survey and surface sampling program of

the plant yard area to determine whether or not Hazardous Waste is present in the yard area. If Hazardous Waste is found, Umetco agrees to assume the cost of reclamation or remediation of the plant site or disposal of such Hazardous Waste, as required by applicable law. At termination of USV's operations at the Niagara Falls Facility, Buyer and Seller agree to share the cost of reclamation of the plant yard area in the same proportions and with the limitation on Buyer's obligation specified in paragraph (e) of Article 1 above, unless USV's operations at said facility have created a materially more expensive reclamation problem (when compared with reclamation based upon an assumed continuation of operations as conducted in the past by Seller and using the results of the radiation survey and surface sampling program as a benchmark), in which event the excess plant yard reclamation costs will be borne by Buyer.

(i) Plant Buildings. Umetco further agrees to assume the cost of decontaminating the three areas of the plant which have been determined to be radioactive based upon Umetco's radiation survey of the plant.

(j) Miscellaneous Slags and Re-Melts in Yard Area. Buyer agrees to assume the cost of disposal, if required, of 20,000 pounds of vanadium aluminum remelts, 4,000 tons of miscellaneous slags from various furnace operations, piles of

lime, etc. in the plant yard area, and empty drums around the plant and all other miscellaneous materials currently on the plant site and not specifically enumerated in paragraphs (a) through (i) above.

(k) Storage Tanks. If in the future USV is required by law to modify, repair or remove the underground gasoline and/or waste oil storage tanks due to evidence of leaking, Seller and Buyer agree to share the cost of modification, repair or removal based upon their respective periods of occupancy of the Niagara Falls Facility, except if such modification, repair or removal is due solely to the business operations of USV, in which event USV shall solely bear such cost.

(l) Appropriate remedial action will be taken with respect to the pond on the eastern boundary of the Niagara Falls Facility.

4. Environmental Work and Access to Premises.

Seller and Buyer have agreed upon a program of work affecting the environment, including, but not limited to, reclamation, restoration, remediation and cleanup, as described in Articles 1 and 3 above, to be performed at the Niagara Falls Facility (hereafter the "Work") by and under the supervision of Seller and at Seller's sole cost and expense. A plan for the Work, including estimated costs of performing various aspects

thereof and estimated time schedules for completing the Work, is attached hereto as Schedule A. Seller agrees to supervise the performance of the Work and covenants that the Work will be performed in a good and workmanlike manner, and in compliance with applicable laws (or, in the absence of such laws, in accordance with generally accepted environmental engineering standards). USV hereby grants to Seller, its contractors and consultants, the right and license to enter the Niagara Falls Facility for the purpose of supervising and performing the Work. Seller agrees, for itself, its contractors and consultants, to exercise such right and license so as to minimize any interference with or disruption of USV's normal commercial operations at the Niagara Falls Facility.

5. Coordination Committee, USV Performance of the Work.

(a) USV and Umetco will each designate two (2) representatives to serve on a Coordination Committee which will oversee the performance of the Work with the goal of assuring completion of the Work in a timely and cost-effective manner, with minimal interference with USV's normal commercial operations at the Niagara Falls Facility.

(b) Upon Umetco's reasonable request, USV will perform all or any portion of the Work described in Schedule A, in a good and workmanlike manner. Umetco shall pay USV monthly



upon receipt of invoice for USV's actual costs of performing the Work (or otherwise agreed contract price).

6. Cost Verification.

USV's books and records will be open to inspection by Umetco upon reasonable notice and during normal business hours, but not more than once every six (6) months, for the purpose of verifying USV's costs of performing the Work.

7. Bridging of Environmental Permits.

(a) To the extent that applicable federal, state or local statute, law, regulation, rule or order requires action to be taken by or on the part of Seller in order for USV to obtain a Transfer of the Environmental Permits, Seller shall take or cause to be taken all such action, and Seller otherwise shall cooperate with USV in obtaining such Transfer. As used in this Article 7, a "Transfer" of Environmental Permits shall mean and include, as applicable, the substitution of USV's name on, and a transfer, reissuance or new issuance to USV of, such Environmental Permits, without any continuing obligation or liability of Seller whatsoever, including, without limitation, as a guarantor or surety thereof.

(b) From and after the closing of the Purchase Agreement, Seller shall maintain, at Buyer's sole cost and expense pursuant to Paragraph (c) below, each of the

Environmental Permits, including all bonds, guarantees or other financial sureties relating thereto or required thereby ("Sureties") until the earlier of (i) expiration of each such Environmental Permit (it being acknowledged that Seller shall have no obligation to renew any Environmental Permit hereunder) or (ii) Transfer of each such Environmental Permit, provided, that during such time USV diligently shall use its best efforts to obtain a Transfer of the Environmental Permits and to obtain any Sureties related to or required by such Environmental Permits. In connection therewith, USV, as promptly as possible, but in no event later than one (1) month after the date of this agreement, shall submit to or file with the appropriate governmental or regulatory authorities, in a complete fashion, all applications and other documents required to be so submitted or filed by USV in order to obtain a Transfer of the Environmental Permits, provided, that such time limitation shall be extended with respect to each applicable Environmental Permit by such period of time that any failure by USV to comply therewith is attributable to action or inaction by or on the part of Seller. Upon either expiration or Transfer of each Environmental Permit as described in subparagraphs (b)(i) or (b)(ii) above, USV's obligation to reimburse Seller for such maintenance of that Environmental Permit shall cease and Seller shall have the right to cancel such Environmental Permit and/or Surety, to the extent such

cancellation is permitted by law. USV promptly shall notify Seller of the Transfer of each Environmental Permit and Seller promptly shall notify USV of any change in the previously scheduled expiration of any Environmental Permit and of any change in the provisions of each Environmental Permit.

(c) Except with respect to any net income taxes payable by Union Carbide, the maintenance of the Environmental Permits and/or Sureties as described in Paragraph (b) above shall be absolutely net to Seller, and Buyer shall reimburse Seller for all direct costs and expenses incurred by Seller in connection with such maintenance; provided, that Seller shall provide USV with such documentation as USV reasonably may request in order to verify the amount of such maintenance costs and expenses. Seller shall invoice USV for all amounts payable hereunder and payment shall be due net thirty (30) days from the date of invoice. If USV fails to make any payment to Seller hereunder when due with respect to any such Environmental Permit, then Seller shall have the right to terminate this agreement with respect to such Environmental Permit if USV does not cure such default within twenty (20) days after notice thereof from Seller.

(d) Prior to Transfer of the Environmental Permits, Buyer shall cooperate with Seller and provide whatever information is needed and perform whatever actions are

necessary to comply with the Environmental Permits in a manner consistent with Seller's past policies and in compliance with the terms and conditions of the Environmental Permits. If USV shall fail to comply with any material term or condition of any Environmental Permit or breach any commitment, agreement or obligation under this agreement, then Seller shall have the right to terminate this agreement with respect to such Environmental Permit if USV does not cease and, if necessary, cure any such noncompliance or breach as soon as practicable but in no event later than twenty (20) days after notice thereof from Seller or within any shorter time period as required by any governmental or regulatory authority, provided, however, that if in Seller's sole good faith judgment any such noncompliance or breach creates, contributes to, or results in, or is likely to create, contribute to, or result in, an emergency situation, Seller may immediately suspend USV's operations under applicable Environmental Permits until such emergency situation or potential emergency situation has ceased, and, if necessary, has been cured. Notwithstanding anything to the contrary contained in the foregoing, Seller shall not terminate this agreement or suspend USV's operations under any Environmental Permit based solely upon (i) noncompliance with the transfer provisions of any Environmental Permit or (ii) any breach of this agreement based solely upon

noncompliance with such transfer provisions unless an applicable federal, state or local government or regulatory authority issues an order or notice of violation that USV's operations under such Environmental Permit is in violation of its transfer provisions and indicates that it will or may take remedial action against Seller as a result thereof. Seller shall promptly notify USV of the termination or suspension of USV's operations under any Environmental Permit under this Paragraph (d) and the reasons therefor.

(e) Buyer shall indemnify Seller against and hold Seller harmless from all claims, damages, losses, liabilities, demands, assessments, fines, penalties, administrative orders, notices of violation, suits, actions or proceedings, costs, expenses and obligations, including interest, penalties and reasonable attorneys' fees (collectively, "Claims"), which arise out of or in connection with (i) USV's failure during the applicable period set forth in paragraph (b) above to comply with the terms and conditions of any Environmental Permit, or the statutes, laws, regulations, rules, orders or codes pertaining thereto or (ii) any breach of any commitment, agreement or obligation by USV under this agreement, provided, however, that USV shall not be obligated to indemnify Seller against any Claims arising solely out of or in connection with any failure by Seller to comply with applicable transfer

provisions of the Environmental Permits. These indemnification provisions relate to this Agreement and shall be in addition to, and not in derogation of, the respective rights, obligations, liabilities and indemnifications of Seller and Stratcor pursuant to the Purchase Agreement.

8. Headings.

Article headings are not to be considered a part of this Agreement, are included solely for convenience, and are not intended to be full of accurate descriptions of the contents thereof.

9. Governing Law.

This Agreement shall be construed in accordance with and governed by the laws of the State of Connecticut.

10. Notices.

Any notice or other communication required or permitted hereunder shall be in writing, and shall be deemed to have been given if placed in the United States mail, registered or certified, postage prepaid, addressed as follows

If to Seller, addressed c/o Union Carbide  
as follows

39 Old Ridgebury Road  
Danbury, Connecticut 06817  
Attention: President, Umetco Minerals Corporation

If to Buyer:

Strategic Minerals Corporation  
30 Main Street  
Danbury, Connecticut 06810

with a copy to.

Gager, Henry & Narkis  
30 Main Street  
Danbury, Connecticut 06810  
Attention: David R. Chipman, Esq.

Each of the foregoing shall be entitled to specify a different address by giving notice as aforesaid to the others.

11. Disputes. Any dispute that the parties are unable to resolve may be submitted to any court having jurisdiction over such dispute.

12. Entire Agreement, Survival, No Waiver.

This Agreement and the other documents and instruments contemplated hereby or thereby constitute the entire agreement between the parties pertaining to the subject matter hereof, and supersede all prior and contemporaneous agreements, understandings, negotiations and discussions, whether oral or written, of the parties, and there are no warranties, representations or other agreements between the parties in connection with the subject matter hereof, except as specifically set forth herein. No supplement, modification, waiver or termination of this Agreement shall be binding unless executed in writing by the party to be bound thereby. No

waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provision hereof (whether or not similar), nor shall such waiver constitute a continuing waiver unless otherwise expressly provided herein.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be entered into and executed by their officers thereunto duly authorized as of the date and year hereinabove set forth.

UNION CARBIDE CORPORATION

By: [Signature] <sup>CPR</sup>  
Title: PRESIDENT, SECURITIES AND SERVICES

UMETCO MINERALS CORPORATION

By: [Signature] <sup>CPR</sup>  
Title: PRESIDENT

STRATEGIC MINERALS CORPORATION

By: [Signature]  
Title: PRESIDENT

U.S. VANADIUM CORPORATION

By: [Signature]  
Title: PRESIDENT



Schedule A

Niagara Falls, New York

Description of Work

<u>Work to be Done</u>	<u>Established Completion Date</u>
A. Replace, retrofill or dispose of PCB containing transformers, capacitors and dispose of cleanup materials.	8/86
B Complete halide scrubber.	8/86
C Dispose of chrome oxide	6/86
D Remove global elevator asbestos.	8/86
E Dispose of high antimony tungsten.	10/86
F Dispose of sample cans.	10/86
G Sample, test and dispose of, if necessary, "Super-sucker" dust	10/86
H Yard area sampling and cleanup, if necessary.	3/87
I Drain and fill "Lake Linde"	6/87
J. Clean up radioactive areas of plant.	6/87

ENVIRONMENTAL AGREEMENT (Niagara Falls)

AGREEMENT made as of this 13<sup>th</sup> day of May, 1986, by and among Union Carbide Corporation, a New York corporation having an office at 39 Old Ridgebury Road, Danbury, Connecticut 06817-0001 ("Union Carbide"), Umetco Minerals Corporation, a Delaware corporation having an office at 39 Old Ridgebury Road, Danbury, Connecticut 06817-0001 ("Umetco") (Union Carbide and Umetco being hereafter collectively called "Seller") and U. S. Vanadium Corporation, a Delaware corporation, with a mailing address c/o Strategic Minerals Corporation, 30 Main Street, Danbury, Connecticut 06810 ("USV") and Strategic Minerals Corporation, a Connecticut corporation having an office at 30 Main Street, Danbury, Connecticut 06810 ("Stratcor") (USV and Stratcor being hereafter collectively called "Buyer").

WITNESSETH

WHEREAS, USV has acquired substantially all the assets of Umetco's U.S. vanadium business pursuant to a Purchase Agreement among Union Carbide, Umetco and Stratcor dated as of April 23, 1986 (the "Purchase Agreement"); and

WHEREAS, the parties desire to provide for certain services to be rendered, work to be done and liabilities to be assumed with respect to Umetco's vanadium and tungsten products processing facility located at Niagara Falls, New York (the "Niagara Falls Facility"), and

WHEREAS, pursuant to the Purchase Agreement, Seller will be transferring to USV all of the environmental permits, licenses and approvals ("Environmental Permits") as identified in Schedule 9 of Exhibit Q to the Purchase Agreement; and

WHEREAS, Seller and Buyer acknowledge that USV will require a reasonable amount of time after the closing of the Purchase Agreement in order to accomplish a prompt transfer of the Environmental Permits;

NOW, THEREFORE, the parties hereto hereby agree as follows

1. Indemnification.

(a) Subject to the provisions of Articles 3 and 7 below, Seller hereby assumes and will be liable for, and shall indemnify Buyer against and hold Buyer harmless from, any and all costs, claims, damages, lawsuits, attorneys' fees, losses, deficiencies, judgments, actions, liabilities and obligations of any kind or description (collectively called "Claims") asserted against, incurred or required to be paid by Buyer (regardless of when asserted or by whom), resulting from Seller's business operations at the Niagara Falls Facility prior to the date of this Agreement. Seller's obligation hereunder is limited to the Claims and Seller shall have no liability whatsoever for incidental or consequential damages to USV.

(b) USV hereby assumes and will be liable for, and shall indemnify Seller against and hold Seller harmless

from any and all Claims asserted against, incurred or required to be paid by Seller (regardless of when asserted or by whom), resulting from USV's business operations at the Niagara Falls Facility from and after the date of this Agreement. USV's obligation hereunder is limited to the Claims and USV shall have no liability whatsoever for incidental or consequential damages to Seller.

(c) Notwithstanding the provisions of paragraph (a) above, but subject to the provisions of paragraph (f) below, Buyer agrees that Seller shall have no further indemnification obligation to Buyer with respect to the reclamation, restoration, testing and/or disposal activities and obligations as set forth in paragraphs (a), (b), (c), (d), (e), (f), (g), (h) and (i) of Article 3, but only upon completion of such reclamation, restoration, testing and/or disposal activities or satisfaction of such obligations by Umetco. Upon request from Seller, Buyer will deliver to Seller a written release confirming the cessation and termination of indemnification contemplated in this Article 1, such release to be in form and substance satisfactory to Seller's counsel.

(d) Buyer further agrees that Seller shall have no indemnification obligation to Buyer with respect to

(i) any PCBs in oil filled switches in the  
Niagara Falls Facility.

(ii) PCBs in capacitors, transformers, oil supplies or in any other areas of the Niagara Falls Facility, except as specifically enumerated in paragraph (a) of Article 3 below.

(iii) any asbestos in the Niagara Falls Facility except as specifically enumerated in paragraph (e) of Article 3 below.

(e) Upon termination of production of products at the Niagara Falls Facility, Buyer and Seller agree to share any final restoration, reclamation or remediation costs required by applicable laws relating to the plant site (provided that any saleable/salvageable assets in the plant will be sold and the proceeds applied to total reclamation liabilities) and any other areas not specifically enumerated in this agreement in proportion to their respective periods of occupancy of the Niagara Falls Facility. Buyer's share of such costs (including costs referred to in paragraph (h) of Article 3 below) shall in no event exceed its period of occupancy of the Niagara Falls Facility (expressed as a percentage) multiplied by \$1,000,000. (The parties acknowledge that Seller conducted operations at the Niagara Falls Facility from 1919 to 1986.)

(f) Buyer and Seller agree to assert no claims of any kind against each other as a result of Seller's, its contractors' or consultants', or Buyer's performance of or supervision of the Work (as hereinafter defined) except in the

event of the gross negligence or willful misconduct of the other party.

(g) Notwithstanding the provisions of paragraph (c) above, Seller's indemnification obligation set forth in paragraph (a) above shall not cease and terminate in the event the Niagara Falls Facility is listed as a "Superfund" site pursuant to the Comprehensive Environmental Response, Compensation and Liability Act.

2. Indemnification Procedure, Right to Contest Reclamation Requirements.

(a) Buyer shall notify Seller within 45 days from the assertion of any Claim or discovery of any fact upon which Buyer intends to base a claim for indemnification hereunder. Buyer's failure to so notify Seller shall relieve Seller from any liability under this Agreement to Buyer with respect to such Claim. Seller shall have the right at its own expense to participate jointly with Buyer in the defense of any claim, demand, lawsuit or other proceeding in connection with which Buyer claims indemnification hereunder and, with respect to any issue involved in such claim, demand, lawsuit or other proceeding as to which Seller shall have acknowledged the obligation to indemnify Buyer hereunder, Seller shall have the sole right to settle or otherwise dispose of such claim, demand, lawsuit or other proceeding on such terms as Seller, in its sole discretion, shall deem appropriate.

(b) Seller shall notify Buyer within 45 days from the assertion of any Claim or discovery of any fact upon which Seller intends to base a claim for indemnification hereunder. Seller's failure to so notify Buyer shall relieve Buyer from any liability under this Agreement to Seller with respect to such Claim. Buyer shall have the right at its own expense to participate jointly with Seller in the defense of any claim, demand, lawsuit or other proceeding in connection with which Seller claims indemnification hereunder and, with respect to any issue involved in such claim, demand, lawsuit or other proceeding as to which Buyer shall have acknowledged the obligation to indemnify Seller hereunder, Buyer shall have the sole right to settle or otherwise dispose of such claim, demand, lawsuit or other proceeding on such terms as Buyer, in its sole discretion, shall deem appropriate.

(c) Seller and Buyer shall each retain the right to contest any restoration, reclamation or remediation requirements imposed by State or other environmental authorities having jurisdiction over the Niagara Falls Facility.

3. Other Environmental Matters.

(a) PCB Transformers and Capacitors. Umetco agrees to assume the cost of retrofilling, replacing or disposing of the following capacitors and transformers as promptly as feasible

Item	SYMBOL	LINE	Action
Transformers 5, 21, 22, 33, 34, 35, 110, 111, 143			Retrofill
Transformers 4, 23, 24, 122, 159, 160 and 161			Dispose
Transformer 119			Dispose & Replace
86 Capacitors for #32 furnace			Dispose
27 Miscellaneous Capacitors			Dispose
Shaft Furnace Capacitors			Dispose

Umetco further agrees to assume the cost of cleanup and disposal of PCB contaminated sludges, oils, waste material currently on site or that will be accumulated when the above equipment is retrofilled or removed. Specifically, Umetco assumes the cost of cleanup and disposal of PCB contaminated soil under the "Owl" transformers, i.e., Nos. 159, 160, and 161, if necessary. ("Retrofilling" is defined as replacing, flushing, etc., of PCB contaminated oils, which when refilled and after the required test runs under power, test at less than 50 ppm PCBS.)

(b) Halide Scrubber. Umetco further agrees to assume the cost of completing installation after the date of this agreement of the halide scrubber now being installed and any corrective modifications to insure compliance with applicable regulations. Once completed and operating as now designed, USV



accepts responsibility for obtaining necessary permits for the system.

(c) Chrome Oxide. Umetco further agrees to assume the cost of disposal of 64 drums of chrome oxide now located at the Niagara Falls Facility.

(d) High Antimony Tungsten. Umetco further agrees to assume the cost of disposal of approximately 100,000 pounds of high antimony tungsten molybdenum oxide now located at the Niagara Falls Facility.

(e) Asbestos in Freight Elevator. Umetco further agrees to assume the cost of removal of the asbestos lining in the global elevator.

(f) "Super Sucker" Dust. Umetco further agrees to test the various waste piles of plant dust deposited by the "Super Sucker" industrial cleaning firm in the plant yard to determine whether such piles are Hazardous Waste (as defined in the Resource Conservation Recovery Act or comparable state law). If any such piles are determined to be Hazardous Waste, under applicable laws, Umetco agrees to assume the cost of removal and disposal of such piles.

(g) Sample Cans. Umetco further agrees to assume the cost of removal and disposal of the numerous small sample cans in the global area.

(h) Yard Area Ores and Slags. Umetco further agrees to conduct a radiation survey and surface sampling program of

the plant yard area to determine whether or not Hazardous Waste is present in the yard area. If Hazardous Waste is found, Umetco agrees to assume the cost of reclamation or remediation of the plant site or disposal of such Hazardous Waste, as required by applicable law. At termination of USV's operations at the Niagara Falls Facility, Buyer and Seller agree to share the cost of reclamation of the plant yard area in the same proportions and with the limitation on Buyer's obligation specified in paragraph (e) of Article 1 above, unless USV's operations at said facility have created a materially more expensive reclamation problem (when compared with reclamation based upon an assumed continuation of operations as conducted in the past by Seller and using the results of the radiation survey and surface sampling program as a benchmark), in which event the excess plant yard reclamation costs will be borne by Buyer.

(i) Plant Buildings. Umetco further agrees to assume the cost of decontaminating the three areas of the plant which have been determined to be radioactive based upon Umetco's radiation survey of the plant.

(j) Miscellaneous Slags and Re-Melts in Yard Area.  
Buyer agrees to assume the cost of disposal, if required, of 20,000 pounds of vanadium aluminum remelts, 4,000 tons of miscellaneous slags from various furnace operations, piles of

lime, etc. in the plant yard area, and empty drums around the plant and all other miscellaneous materials currently on the plant site and not specifically enumerated in paragraphs (a) through (i) above.

(k) Storage Tanks. If in the future USV is required by law to modify, repair or remove the underground gasoline and/or waste oil storage tanks due to evidence of leaking, Seller and Buyer agree to share the cost of modification, repair or removal based upon their respective periods of occupancy of the Niagara Falls Facility, except if such modification, repair or removal is due solely to the business operations of USV, in which event USV shall solely bear such cost.

(l) Appropriate remedial action will be taken with respect to the pond on the eastern boundary of the Niagara Falls Facility.

4. Environmental Work and Access to Premises.

Seller and Buyer have agreed upon a program of work affecting the environment, including, but not limited to, reclamation, restoration, remediation and cleanup, as described in Articles 1 and 3 above, to be performed at the Niagara Falls Facility (hereafter the "Work") by and under the supervision of Seller and at Seller's sole cost and expense. A plan for the Work, including estimated costs of performing various aspects

thereof and estimated time schedules for completing the Work, is attached hereto as Schedule A. Seller agrees to supervise the performance of the Work and covenants that the Work will be performed in a good and workmanlike manner, and in compliance with applicable laws (or, in the absence of such laws, in accordance with generally accepted environmental engineering standards). USV hereby grants to Seller, its contractors and consultants, the right and license to enter the Niagara Falls Facility for the purpose of supervising and performing the Work. Seller agrees, for itself, its contractors and consultants, to exercise such right and license so as to minimize any interference with or disruption of USV's normal commercial operations at the Niagara Falls Facility.

5. Coordination Committee, USV Performance of the Work.

(a) USV and Umetco will each designate two (2) representatives to serve on a Coordination Committee which will oversee the performance of the Work with the goal of assuring completion of the Work in a timely and cost-effective manner, with minimal interference with USV's normal commercial operations at the Niagara Falls Facility.

(b) Upon Umetco's reasonable request, USV will perform all or any portion of the Work described in Schedule A, in a good and workmanlike manner. Umetco shall pay USV monthly

upon receipt of invoice for USV's actual costs of performing the Work (or otherwise agreed contract price).

6. Cost Verification.

USV's books and records will be open to inspection by Umetco upon reasonable notice and during normal business hours, but not more than once every six (6) months, for the purpose of verifying USV's costs of performing the Work.

7. Bridging of Environmental Permits.

(a) To the extent that applicable federal, state or local statute, law, regulation, rule or order requires action to be taken by or on the part of Seller in order for USV to obtain a Transfer of the Environmental Permits, Seller shall take or cause to be taken all such action, and Seller otherwise shall cooperate with USV in obtaining such Transfer. As used in this Article 7, a "Transfer" of Environmental Permits shall mean and include, as applicable, the substitution of USV's name on, and a transfer, reissuance or new issuance to USV of, such Environmental Permits, without any continuing obligation or liability of Seller whatsoever, including, without limitation, as a guarantor or surety thereof.

(b) From and after the closing of the Purchase Agreement, Seller shall maintain, at Buyer's sole cost and expense pursuant to Paragraph (c) below, each of the

Environmental Permits, including all bonds, guarantees or other financial sureties relating thereto or required thereby ("Sureties") until the earlier of (i) expiration of each such Environmental Permit (it being acknowledged that Seller shall have no obligation to renew any Environmental Permit hereunder) or (ii) Transfer of each such Environmental Permit; provided, that during such time USV diligently shall use its best efforts to obtain a Transfer of the Environmental Permits and to obtain any Sureties related to or required by such Environmental Permits. In connection therewith, USV, as promptly as possible, but in no event later than one (1) month after the date of this agreement, shall submit to or file with the appropriate governmental or regulatory authorities, in a complete fashion, all applications and other documents required to be so submitted or filed by USV in order to obtain a Transfer of the Environmental Permits; provided, that such time limitation shall be extended with respect to each applicable Environmental Permit by such period of time that any failure by USV to comply therewith is attributable to action or inaction by or on the part of Seller. Upon either expiration or Transfer of each Environmental Permit as described in subparagraphs (b)(i) or (b)(ii) above, USV's obligation to reimburse Seller for such maintenance of that Environmental Permit shall cease and Seller shall have the right to cancel such Environmental Permit and/or Surety, to the extent such

cancellation is permitted by law. USV promptly shall notify Seller of the Transfer of each Environmental Permit and Seller promptly shall notify USV of any change in the previously scheduled expiration of any Environmental Permit and of any change in the provisions of each Environmental Permit.

(c) Except with respect to any net income taxes payable by Union Carbide, the maintenance of the Environmental Permits and/or Sureties as described in Paragraph (b) above shall be absolutely net to Seller, and Buyer shall reimburse Seller for all direct costs and expenses incurred by Seller in connection with such maintenance; provided, that Seller shall provide USV with such documentation as USV reasonably may request in order to verify the amount of such maintenance costs and expenses. Seller shall invoice USV for all amounts payable hereunder and payment shall be due net thirty (30) days from the date of invoice. If USV fails to make any payment to Seller hereunder when due with respect to any such Environmental Permit, then Seller shall have the right to terminate this agreement with respect to such Environmental Permit if USV does not cure such default within twenty (20) days after notice thereof from Seller.

(d) Prior to Transfer of the Environmental Permits, Buyer shall cooperate with Seller and provide whatever information is needed and perform whatever actions are

necessary to comply with the Environmental Permits in a manner consistent with Seller's past policies and in compliance with the terms and conditions of the Environmental Permits. If USV shall fail to comply with any material term or condition of any Environmental Permit or breach any commitment, agreement or obligation under this agreement, then Seller shall have the right to terminate this agreement with respect to such Environmental Permit if USV does not cease and, if necessary, cure any such noncompliance or breach as soon as practicable but in no event later than twenty (20) days after notice thereof from Seller or within any shorter time period as required by any governmental or regulatory authority; provided, however, that if in Seller's sole good faith judgment any such noncompliance or breach creates, contributes to, or results in, or is likely to create, contribute to, or result in, an emergency situation, Seller may immediately suspend USV's operations under applicable Environmental Permits until such emergency situation or potential emergency situation has ceased, and, if necessary, has been cured. Notwithstanding anything to the contrary contained in the foregoing, Seller shall not terminate this agreement or suspend USV's operations under any Environmental Permit based solely upon (i) noncompliance with the transfer provisions of any Environmental Permit or (ii) any breach of this agreement based solely upon



noncompliance with such transfer provisions unless an applicable federal, state or local government or regulatory authority issues an order or notice of violation that USV's operations under such Environmental Permit is in violation of its transfer provisions and indicates that it will or may take remedial action against Seller as a result thereof. Seller shall promptly notify USV of the termination or suspension of USV's operations under any Environmental Permit under this Paragraph (d) and the reasons therefor.

(e) Buyer shall indemnify Seller against and hold Seller harmless from all claims, damages, losses, liabilities, demands, assessments, fines, penalties, administrative orders, notices of violation, suits, actions or proceedings, costs, expenses and obligations, including interest, penalties and reasonable attorneys' fees (collectively, "Claims"), which arise out of or in connection with (i) USV's failure during the applicable period set forth in paragraph (b) above to comply with the terms and conditions of any Environmental Permit, or the statutes, laws, regulations, rules, orders or codes pertaining thereto or (ii) any breach of any commitment, agreement or obligation by USV under this agreement, provided, however, that USV shall not be obligated to indemnify Seller against any Claims arising solely out of or in connection with any failure by Seller to comply with applicable transfer

provisions of the Environmental Permits. These indemnification provisions relate to this Agreement and shall be in addition to, and not in derogation of, the respective rights, obligations, liabilities and indemnifications of Seller and Stratcor pursuant to the Purchase Agreement.

8. Headings.

Article headings are not to be considered a part of this Agreement, are included solely for convenience, and are not intended to be full of accurate descriptions of the contents thereof.

9. Governing Law.

This Agreement shall be construed in accordance with and governed by the laws of the State of Connecticut.

10. Notices.

Any notice or other communication required or permitted hereunder shall be in writing, and shall be deemed to have been given if placed in the United States mail, registered or certified, postage prepaid, addressed as follows.

If to Seller, addressed c/o Union Carbide  
as follows:

39 Old Ridgebury Road  
Danbury, Connecticut 06817  
Attention: President, Umetco Minerals Corporation

If to Buyer:

Strategic Minerals Corporation  
30 Main Street  
Danbury, Connecticut 06810

with a copy to:

Gager, Henry & Narkis  
30 Main Street  
Danbury, Connecticut 06810  
Attention: David R. Chipman, Esq.

Each of the foregoing shall be entitled to specify a different address by giving notice as aforesaid to the others.

11. Disputes. Any dispute that the parties are unable to resolve may be submitted to any court having jurisdiction over such dispute.

12. Entire Agreement, Survival, No Waiver.

This Agreement and the other documents and instruments contemplated hereby or thereby constitute the entire agreement between the parties pertaining to the subject matter hereof, and supersede all prior and contemporaneous agreements, understandings, negotiations and discussions, whether oral or written, of the parties, and there are no warranties, representations or other agreements between the parties in connection with the subject matter hereof, except as specifically set forth herein. No supplement, modification, waiver or termination of this Agreement shall be binding unless executed in writing by the party to be bound thereby. No

waiver of any of the provisions of this Agreement shall be deemed or shall constitute a waiver of any other provision hereof (whether or not similar), nor shall such waiver constitute a continuing waiver unless otherwise expressly provided herein.

IN WITNESS WHEREOF, the parties hereto have caused this Agreement to be entered into and executed by their officers thereunto duly authorized as of the date and year hereinabove set forth.

UNION CARBIDE CORPORATION

By: [Signature] <sup>CR</sup>  
Title: President, Strategic Services

UMETCO MINERALS CORPORATION

By: [Signature] <sup>CR</sup>  
Title: President

STRATEGIC MINERALS CORPORATION

By: [Signature]  
Title: President

U.S. VANADIUM CORPORATION

By: [Signature]  
Title: President

Schedule A

Niagara Falls, New York

Description of Work

<u>Work to be Done</u>	<u>Established Completion Date</u>
A. Replace, retrofill or dispose of PCB containing transformers, capacitors and dispose of cleanup materials.	8/86
B Complete halide scrubber.	8/86
C. Dispose of chrome oxide	6/86
D. Remove globar elevator asbestos.	8/86
E. Dispose of high antimony tungsten.	10/86
F. Dispose of sample cans.	10/86
G Sample, test and dispose of, if necessary, "Super-sucker" dust.	10/86
H Yard area sampling and cleanup, if necessary.	3/87
I. Drain and fill "Lake Linde"	6/87
J. Clean up radioactive areas of plant.	6/87

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Schedule A

Niagara Falls, New York

Description of the Work

<u>Work to be Done</u>	<u>Estimated Cost M\$</u>	<u>Estimated Completion Date</u>
A. Replace, retrofill or dispose of PCB containing transformers, capacitors and dispose of cleanup materials.	200-250	8/86
B. Complete halide scrubber.	100	8/86
C. Dispose of chrome oxide	8-10	6/86
D. Remove global elevator asbestos.	12-15	8/86
E. Dispose of hi antimony tungsten.	15-25	10/86
F. Dispose of sample cans	15-25	10/86
G. Sample, test and dispose of, if necessary, super-sucker dust.	5-75	10/86
H. Yard area sampling and cleanup, if necessary.	25- ? (big)	3/87
I. Drain and fill Lake Linde	25-50	12/86
J. Clean up radioactive areas of plant.	25-50	8/86

UCCNHT0000080

# Umetco Minerals Corporation



PO BOX 66 137 47th STREET • NIAGARA FALLS NEW YORK 14302

March 2, 1987

MAR 5 1987

Mr. P. K. Willmott  
Umetco Minerals Corporation  
Section P2615  
30 Old Ridgebury Road  
Danbury, CT 06817

Subject Summary Report of the Withdrawal of Umetco from Niagara Falls

Dear Paul:

The accompanying report summarizes the activities that were associated with the closing of the Technology Department and the sale of the Niagara Plant to Stratcor. With the exception of getting together with Jack Frost to familiarize him with where and how the pertinent information is filed and perhaps one more day on surplus equipment I consider I have done all the damage I can. To say the least, it has been an interesting, if sometimes frustrating several months. However I am satisfied that Union Carbide obligations have been successfully accomplished.

If I can be of any help in the future please don't hesitate to call on me.

Let's hope we can get together on a social basis one of these days.

Sincerely,

D. J. Hansen

/mau  
Attachment

cc Messrs  
✓ J. F. Frost  
T. J. Kagetsu

UCCNHT0000081

SUMMARY REPORT

WITHDRAWAL OF UMETCO FROM NIAGARA FALLS

by

D. J. Hansen

February 1987



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## 1.0 INTRODUCTION

The Technology Department of Umetco Minerals Corporation was disbanded on March 31, 1985. Many items associated with the closing extended well beyond that date. These included transfer and sale of equipment, disposal of chemicals, termination of radioactive material licenses, reorganizing files, and withdrawal from the Elkem premises.

When Union Carbide subsequently sold the Niagara Plant to Strategic Minerals Corporation an Environmental Agreement was signed on May 13, 1986 in which liabilities were defined and certain reclamation, restoration, and disposal obligations were innumarated.

This report briefly summarizes the work completed in both of these areas. Details are contained in separate files which are presently located in Niagara Falls.

## 2.0 ENVIRONMENTAL ISSUES (NIAGARA FALLS)

Article 3 "Other Environmental Matters" - sections (a) through (l) of the Environmental Agreement (Niagara Falls) between Union Carbide and Strategic Minerals Corporation lists the obligations of Umetco to U. S. Vanadium.

One of these, (Item j), concerns vanadium slags and remelts and is the responsibility of U. S. Vanadium. Item k, dealing with the underground storage tanks is ongoing. U. S. Vanadium has signed letters acknowledging that 7 of the 10 remaining items were completed to their satisfaction. I have been assured that sign-off on another two, Item (a) PCB Transformers and Item (e) Asbestos in Freight Elevator will take place soon. The last one, Item (b) Halide Scrubber will be signed off after the stack discharge permit has been obtained.

More specific information on each of the items follows.

### 2.1 PCB Transformers and Capacitors

Eight transformers and in excess of 100 capacitors that contained PCB's were disposed of in May 1986 under the direction of U. S. Vanadium personnel. At that time, six transformers belonging to U. S. Vanadium and three belonging to Linde Division were retrofilled by UNISON. One of the transformers of U. S. Vanadium is a spare and could not be placed in service for the 90-days required prior to analysis and reclassification. Another failed to come to the required 50°C temperature. Mr. Gary R. Pilcher, Regional Service Manager of UNISON, has written to C. T. Wentzel agreeing to assume responsibility for reclassification at no cost to U. S. Vanadium or Umetco. A letter requesting sign-off was sent to C. T. Wentzel on January 19, 1987. I spoke with him by phone on February 17 at which time he assured me that he saw no problem.

### 2.2 Halide Scrubber

Prior to the sale, returned vanadium halide cylinders were cleaned in the yard and discharged to a sewer. In October 1985 a scheme was proposed to discharge the cylinders to a trough containing water jets that would direct the fumes to an improved scrubber. The cost was estimated to be \$70,000. In October 1986, the completed system in which costs had escalated to \$95,000

was found inadequate. It was necessary to extend a shed so that tanks could be discharged out of the wind. Additional capital was authorized by Mr. F. V. McMillen on October 10, 1986 with a stipulation that Umetco would not pay more than \$118,500. Modifications were completed and the system operated successfully on January 7, 1987.

A letter requesting "sign-off" was written to C. T. Wentzel on January 14. He sent a letter to Messrs. DeAtley and Miller on February 13 informing them that applications for air permits had been mailed to New York State D.E.C. It is my understanding they will sign-off when the permits are obtained.

### 2.3 Chrome Oxide

Fifty-one drums containing approximately 11 tons of vanadium bearing slag that had been contaminated with chrome oxide was disposed of by Chemical Waste Management (SCA Chemical Services) on April 10 and 11, 1986. A copy of the letter acknowledging that U. S. Vanadium was satisfied was mailed to F. V. McMillen on October 27, 1986.

### 2.4 High Antimony Tungsten

On April 2, 1986, approximately 50 tons of tungsten molybdenum oxide contaminated with antimony was disposed of by Chemical Waste Management (SCA Chemical Services). A copy of the letter acknowledging U. S. Vanadium "sign-off" was mailed to F. V. McMillen on October 27, 1986.

### 2.5 Asbestos in Freight Elevator

By the terms of the Environmental Agreement, UCC has "no indemnification obligation to Buyer with respect to --- (iii) any asbestos in the Niagara Falls Facility except as specifically enumerated in paragraph (e) of Article 3--". Paragraph (e) refers only to the removal of the asbestos lining in the Global elevator. The Union Carbide Corporate Audit Team agreed that asbestos should also be removed from the Old Boiler House, pipelines outside the Old Boiler House, and Building 111 which were not part of the sale to Stratcor. This was an insurance against potential future liability.

The successful bidder was Niagara Insulations, Inc. at \$61,800.

Removal of asbestos from the elevator turned out to be much more complex than anticipated. Niagara Insulations elected to use a high pressure water jet. Unfortunately it was only partially effective and also caused asbestos to be forced through the joints in the corrugated steel walls resulting in contamination outside the elevator. Not only did the job take longer than expected but Niagara Insulations personnel had to be brought back on three occasions because the job was not completed to our satisfaction. The water treatment also removed lubrication from the elevator cable and pulleys and it was necessary to bring in Otis Elevator Company to correct this. However, on the plus side lubricating the cables also served to immobilize any fibers that may have been worked into the cable strands.

The atmosphere within the elevator was sampled by Asteco, Inc. on October 7, 1986 and again on December 11, 1986 to determine the extent of

airborn fibers. On both dates the readings were below the .01 fibers per cubic ft. recommended as satisfactory after cleanup by EPA. (1)

A letter was sent to C. T. Wentzel December 16 requesting sign-off. However U. S. Vanadium was not satisfied and resampled on February 11, 1987. This time no fibers were found in the sample. C. T. Wentzel told me by phone on February 17 that U. S. Vanadium will sign-off when he receives the written report from Asteco Inc.

## 2.6 "Super Sucker" Dust

"Super Sucker" dust is the material collected by a commercial vacuum cleaner from the rafters at various locations within the Niagara Plant. The contents of the machines are discharged randomly in the yard east of No. 5 Furnace Room. Various piles of this material were sampled by George Parker of U. S. Vanadium and analyzed by Ecology and Environment Inc. in May 1986 for leachable toxic substances. None were found which technically let us off the hook. However, it was decided to remove these materials to a sanitary land fill to avoid any questions in the future. Modern Disposal Services took care of this on August 11, 1986. U. S. Vanadium's letter of acceptance was mailed to F. V. McMillen on October 27, 1986.

## 2.7 Sample Cans

Over the years samples of raw materials, slags and ferroalloys were collected, placed in one quart tins and stored in a caged area in Building 25. Disposal of these presented a problem since the contents had to be identified and then classified as toxic or non-toxic. In addition, numerous samples, notably those from pyrocholors and uranium ores were radioactive. The disposal was begun under the direction of George Parker of U. S. Vanadium and a shipment of non-hazardous material was removed by BFI Waste System in 1985. We assumed responsibility for the remaining 1200 samples in July 1986. There were classified as radioactive, non-hazardous, or toxic and were handled accordingly. The radioactive material was included in a shipment to Barnwell, South Carolina, September 19, 1986. The balance of the samples, after classification, were emptied into 50 gallon drums. The non-toxics were removed by BFI Waste Systems on October 10, 1986, the toxic material by SCA Chemical Services on November 24, 1986. The storage area was thoroughly cleaned and monitored to be assured no radioactive material remained. A letter of acceptance by U. S. Vanadium was mailed to P. K. Willmott on January 14, 1987.

## 2.8 Yard Area - Ores and Slags

A radiation survey and surface sampling were completed in the yard area east and north of the Niagara Plant. The purpose was to determine if hazardous waste was present in this area, in which case Umetco would assume the cost of reclamation, or if not, the surveys could serve as a benchmark for deciding reclamation costs at the termination of U. S. Vanadium operations at Niagara Falls.

- (1) The Department of Labor (OSHA) as of June 20, 1986 will allow 0.2 fibers per cc but requires medical surveillance at 0.1 fibers per cc. The regulation for permissible airborne fibers in the workplace are an order of magnitude higher than that suggested by EPA after cleanup.

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U. S. Vanadium signed off on this item in October 1986.

## 2.9 Plant Buildings

A gamma radiation survey completed in February 1986 uncovered three areas within the plant that had radiation significantly above background. These were an area immediately adjacent to No. 30 Furnace in Building 29, a pit in Building 24 (VA1), and a slag pile east of Building 29. This discovery caused some concern because we had been actively trying to terminate our radioactive material licenses for over a year. Mr. R. Kelly of the State of New York - Department of Labor, was informed and later met with Bob Beverly and me to decide on the proper course of action.

We discovered that New York State is more lenient than NRC on defining allowable concentrations of natural occurring radioactivity (500  $\mu\text{g/g}$  of combined U + Th and radiation less than 250  $\mu\text{R}$  at surface). The contaminated ilmenite in the pit in Building 24 and the slag in the yard area contained less than this limit. However, Dr. F. J. Bradley, Principle Radiophysicist of the New York Department of Labor suggested it would be wise to remove the material to a waste site to avoid riders on the lease of the property.

Subsequently, nineteen 55-gallon drums of radioactive soil and slag from No. 30 Furnace were shipped to Barnwell Waste Management Facility, SC by Chem Nuclear Systems on September 19, 1986. The 125 drums of low level radioactive ilmenite from Building 24 and the 75 tons of low level radioactive slag were disposed of by Chemical Waste Management (SCA) on June 18, 19 and 20. The areas adjacent to No. 30 Furnace and the pit in Building 24 were backfilled with crushed stone by Dube Construction Company.

U. S. Vanadium signed the letter of acknowledgement in October 1986.

## 2.10 Drain and Level Lake

A low area east of the Niagara Plant on the property line between L-Tec and U. S. Vanadium collected rain water and discharge from L-Tec forming a sizeable artificial pond sometimes referred to as "Lake Linde". After consultation between personnel from Linde, L-Tec, and Umetco it was decided to take remedial action. The north end of the pond was drained by L-Tec in April 1986.

The final draining and grading was completed by Dube Construction on August 22, 1986. Several truckloads of clay from Elkem property was used as fill. This material had been used as a temporary cap over an area that had been excavated to remove radioactive soil. Samples of the clay were obtained by Advanced Environmental Systems and analyzed for leachable EP Toxicity Metals. The samples were then forwarded to the Linde Division R&D Analytical Services for radio-assays. There were no leachable toxic metals and the radioactivity was barely above background.

Polaroid snapshots of the graded area were submitted as part of the record.

U. S. Vanadium signed off on this item in October 1986.

### 3.0 CLOSING OF THE TECHNOLOGY DEPARTMENT

#### 3.1 Transfer and Sale of Equipment and Furniture

When the disbanding of the Technology Department was announced all the laboratory equipment at Niagara Falls (and Grand Junction) became surplus. The equipment lists that had been prepared for the "Tiger" project were circulated to the Niagara, Hot Springs and Bishop Plants. Equipment was shipped on request on a "first come - first served" basis. The Hot Springs Plant was the most aggressive receiving about 90% of the Grand Junction analytical laboratory equipment plus two large shipments from Niagara Falls.

The balance of the sale was placed in the hands of Investment Recovery. Their first order of priority was to offer surplus equipment to other divisions of Union Carbide. Roy Sommers visited the Technology facility and prepared a booklet listing those items he thought would move quickly. Closing Date for request was set as October 15, 1985.

The response within the Corporation was good. Eighteen locations made requests and equipment with an initial value of \$139,852 was transferred.

Elkem Metals was given first choice when sales were opened up outside the Corporation. They purchased considerable equipment to which was assigned an \$11,190 price tag.

The choice office furniture, i.e. that constructed of wood, both from R&D and Engineering went to the Linde Divisions located next door.

Most of the equipment and furniture remaining was moved to the vacant "Old Works Lab", (Building 111) prior to the termination of our lease with Elkem December 31, 1985. Some of the heavier pieces were stored in garages near the Engineering Building. Furniture and partitions from Engineering (Building 149) were also stored in Building 11 when that facility was turned over to Linde Division.

Investment Recovery invited several used equipment dealers to bid on what was left. Representatives from two firms, BoChem and J. Little Mercer sent representatives to view the equipment. BoChem submitted a bid of \$1750 which was turned down.

On February of 1986 an inventory of what was available, including the contents of the more than 241 cartons used in moving, was compiled and sent to Investment Recovery. They sent the list out again inviting bids for a "as is, where is" package. Polyscience, Inc. made an offer of \$6800 which was accepted on May 19, 1986 by Investment Recovery. This offer was subsequently withdrawn.

J. Little Mercer Company made a revised bid of \$10,000 in June 1986 but when they found out that Polyscience had dropped out of the bidding they withdrew their offer.

We then began to sell small orders of equipment to small local firms and some furniture to individuals. There were approximately 21 transactions with total sales amounting to \$7,410.

The contents of the garage were sold for scrap in February 1987 because U. S. Vanadium wanted use of the area. Ownership of Building 111 remains with Union Carbide; Linde Gas Products will act as caretaker. To the best of my knowledge Investment Recovery will leave the equipment in Building 111 until it becomes necessary to dispose of it all.

### 3.2 Vacating Elkem Buildings

Building 169 housed the Carvan Shaft Furnace, the Rotolouvre Dryer (Asbestos Plant), the Pilot Heap Leach, as well as some small scale laboratory equipment. When the decision was made to retain the shaft furnace, Jack Zasler was hired as a consultant to supervise its dismantling and transfer to the Niagara Plant. The Asbestos Pilot Plant was dismantled and components sold or scrapped. Scrufari Construction Company performed the work under Jack's supervision. Asteco Inc. was retained to obtain air samples to assure that asbestos fibers was not rendered airborne during the disassembly. Building 169 was thoroughly cleaned to the satisfaction of Elkem personnel before vacating. The dismantling costs were estimated to be \$15,000 plus \$12,000 for Investment Recovery's role.

The equipment and furniture in Buildings 166 and 94 were moved to Building 111 in November and December of 1985 by Kuhns Moving and Storage Company. The total moving cost was about \$16,000.

### 3.3 Disposal of Chemicals

It was customary for each laboratory within the Niagara Falls complex to have a stock of chemicals. To simplify disposal, the chemicals in each of the labs were collected in two central locations - one for inorganics and one for organics. They were then grouped according to element or compound and a comprehensive listing was prepared. There were in excess of 2500 items. A copy of the list was sent out to the Umetco Plants and to Elkem to see if they had use for any of these chemicals. Elkem, the only respondent, took about 100 items.

SCA Chemicals, with whom Union Carbide had a national contract, handled the packaging and disposal of the balance. Tracking down the composition of the numerous organic chemicals used in mineral dressing proved quite challenging. The disposal costs were approximately \$15,000, probably a bargain considering the time SCA personnel had to spend on this job.

In April of 1986 additional mineral dressing chemicals that were stored in Building 99 and had been overlooked were disposed of at an additional cost of \$3,700.

### 3.4 Termination of Radioactive Material Licenses

The Niagara Complex had acquired three radioactive material licenses. License No. 955-0139 for a radioactive source for a density gauge and No. 950-0139 to allow processing of columbium ores were assigned to the plant. License No. 210-0090, assigned to Technology, was for several radioactive sources.

#### 3.4.1 License No. 955-0139

This license was for one (1) 150 mCi Cs 137 source used in an Ohmart density gauge to measure the specific gravity of calcium hydroxide sludge in a pipe. It was granted in February 1965, it was amended 10 times, the most recent being October 1981. The source was sent back to the manufacturer by George Parker in August 1985. License termination was granted on September 4, 1986.

#### 3.4.2 License No. 950-0139

The original license was issued to Olefins and Metals Division of UCC in January 1965. The license superseded U. S. Atomic Energy Commission License No. SUB-469 which was terminated when jurisdiction passed from federal to state control. It was issued to cover the processing of ores and the storage of slags containing thorium and uranium used or generated in the production of ferrocolumbium.

Production of ferrocolumbium was discontinued about 1972, a letter requesting termination of the license was written to New York State by Mr. D. Brosnahan on March 11, 1982. However an earlier survey by DOE/MED indicated areas of above background radiation on Metals Division property behind Building 166. A subsequent survey by R. Kelly of New York State Department of Labor in April 1982 showed four areas to be out of compliance. The contaminated soil was removed over a period of two years. Samples taken on March 20, 1986 were found to be free of contamination and termination of the license was granted on August 15, 1986.

#### 3.4.3 License No. 210-0090

This license was issued to the Technology Department of Union Carbide Metals Company on November 28, 1962. It superseded AEC License No. 31-1069-2. At that time it covered four radioactive elements for use in radiochemical tracer studies. We have ten amendments on file, the last one dated May 11, 1982 which added a new Cobalt 57 Sealed Source.

A request was made to terminate this license on February 7, 1986. At that time the following sealed sources were included in the license 2 Cesium 137, 1 (ea.) Cd 109, Fe 55, Co 57, and Pu 238. In addition, at that time, the Lab had on hand an unknown radium source, an alphasource gauge, about 3-1/2 pounds of thorium chemicals, four fused thorium oxide



crucibles, and an Alnor dewpointer. A table, which was included in the request for termination, indicating the details of disposal is reproduced below. The license was terminated on August 15, 1986.

#### DISPOSAL OF RADIOACTIVE MATERIALS

<u>Radioactive Source</u>	<u>Disposal</u>	<u>Broker or Manufacturer</u>	<u>Packaged By</u>	<u>Carrier</u>	<u>Date</u>
(2) CS 137	Nuclear Res Warrington, PA	Accuray (Manufacturer)	C Kolodjeski (Accuray)	Smith Transfer	10/17/85
Alnor Dewpointer	Alnor Inst.Co. Skokie, IL (Manufacturer)		A Gonas (Umetco)	U P S	12/6/85
Cd 109 Co 57 Fe 55 Pu 238	Amersham (Manufacturer)		F Susterick (Amersham)	Federal Express	12/10/85
Thorium Oxide(1/2#) Nitrate(2#) Chloride(1#) (4) Thorium Crucibles - 3-1/2" x 1-3/4" Alphatron Gauge Radium Source	US Ecology Richland, WA	Chem Nuclear (Broker)	J Bender (Chem Nuclear)	Consolidated Freightways	12/31/85

### 3.5 Technology Files

At the time of the sale of the ferroalloy related business to Elkem in 1981 the Technology Files were split along product lines. The Metals Division continued to use the same file room and shared the part time services of Mrs. Florence Englander, an experienced file clerk. Unfortunately the files were not complete - primarily because incoming correspondence, reports, etc., were in most cases not forwarded for filing. Most of this information was buried in individual's personal files. Again, unfortunately, these were never sorted when personnel were retired, transferred or terminated.

The Technology Files, both from Niagara Falls and Grand Junction, together with numerous personal files that remained were physically transferred to the Niagara Plant prior to December 31, 1985. Over the next several months these were culled, sorted, and indexed. The uranium files (19 boxes) were shipped to Grand Junction on August 14, 1986.

The remaining files on vanadium, tungsten, and numerous other topics were sorted and turned over to U.S. Vanadium in October 1986. Copies of the Technology Files Index together with a letter listing the contents of the other files was mailed to appropriate Umetco personnel on October 30, 1986.

The patent files, including the dockets dealing with uranium are located in the same room.

### 3.6 Decontamination and Restoration of Elkem Site

Personnel from ORNL and DOE surveyed the Technology Site in August of 1976 because this property had housed uranium metal production in 1942. Above background beta-gamma readings were found behind Building 166. Subsequent aerial radiological surveys in 1978 and 1979 showed no anomalies on the Union Carbide site. In September 1980, ORNL personnel conducted a follow-up radiological survey and found relatively high concentrations of the gamma-emitting radionuclides of the thorium 232 and uranium 238 decay chains in the surface soil around Building 166 and 163. It was concluded, based on U-238 and Ra-226 ratios, that the contamination was from thorium bearing ores and not uranium metal. It was recommended a more comprehensive survey be completed.

A preliminary radiation survey was conducted by Dave Brosnahan in October 1981 which showed high concentrations along the railroad tracks behind Building 166.

On December 7, 1981, UCC was cited for being in violation of the New York Radioactive Materials License 950-0139. Concentrations of source material exceeded limits specified for uncontrolled areas.

A comprehensive radiation survey was then undertaken by Lee Evans and Dave Brosnahan and a Design Memo "Radiological Survey, Cleanup Options and Cost Estimates" was released by Lee Evans on July 13, 1983. The decision was made to proceed with the most expensive option (\$335M) which involved removal of soil and shipping it to a repository.

Excavation began in the summer of 1984 and shipments to both Uravan, Colorado for processing and Barnwell, South Carolina for burial continued until the end of the year.

The excavated area was backfilled with clay. [Elkem Metals objected to this step, complaining that the compacted clay would not yield a surface that would be satisfactory for storage or vehicle traffic.]

Analysis of samples, taken before excavation in July 1984, after excavation, and after backfilling in October 1984, at surface and depths of six and twelve inches, were forwarded to New York State in July 1985. The delay in analytical results was caused in part by the closing of the Grand Junction Analytical Lab. Later, samples had to be resubmitted when Alpha Nuclear in Dallas analyzed the incorrect thorium isotope.

Mr. Kelly, Department of Labor, obtained samples to verify cleanup on March 20, 1986. Notification that the license was terminated was received on August 15, 1986.

Dube Construction Company was awarded a contract (\$18,500) to restore the Elkem property. This consisted of excavating about one foot of the clay cap and backfilling with crushed stone.

Mr. Richard Crago, Site Manager of Elkem Metals, signed a letter on September 9, 1986 acknowledging that the restoration and delicensing was completed to their satisfaction. It was suggested a copy of this letter be placed in the Tiger Project Files. Polaroid snapshots of the job at completion are retained in the file here at Niagara Falls.

#### 4.0 OTHER ACTIVITIES

##### 4.1 Removal of Boiler Room Stacks

Union Carbide elected to retain the old boiler room complex as insurance when Occidental Petroleum began to provide steam to the Niagara Complex. This facility was retained when surrounding building were sold to Niacet in 1981. The age and condition of the boilers precluded further use and the two stacks presented a safety problem. The stacks were taken down by Scrufari Construction Company July 22 through July 24, 1986 at a cost of about \$4400. This included an overrun of about \$2000, the cost of bringing in a heavier crane which was necessary when the stacks were found to be double walled and filled with insulation. The double wall caused additional problems for the scrap dealer selected for the disposal. It became too expensive for him to cut the stacks into small enough sections for him to be able to mount the pieces on his trucks. To avoid the liability of stacks lying on Niacet property, Scrufari Construction was commissioned by us to assist in the removal. This was accomplished on February 11, 1987. The cost was approximately \$1000.

##### 4.2 Asbestos Removal

The boilers and associated piping of the Old Boiler House were insulated with asbestos. The insulation on the six pipes that ran for approximately 800 feet on a pipe rack was in sad condition. In addition, asbestos insulation was found on steam lines within Building 111. The decision was made to remove this material for environmental and safety considerations. This work was included in the contract awarded to Niagara Insulation in August 1986.

#### 5.0 CONCLUSION

This report contains an overview of the tasks involved when a major facility is closed and sold. It is meant only to be a summary which could lead somebody interested in more detail to the proper files.

# Umetco Minerals Corporation



PO BOX 66 137 47th STREET • NIAGARA FALLS NEW YORK 14302

March 2, 1987

MAR 5 1987

Mr. P. K. Willmott  
Umetco Minerals Corporation  
Section P2615  
30 Old Ridgebury Road  
Danbury, CT 06817

Subject: Summary Report of the Withdrawal of Umetco from Niagara Falls

Dear Paul:

The accompanying report summarizes the activities that were associated with the closing of the Technology Department and the sale of the Niagara Plant to Stratcor. With the exception of getting together with Jack Frost to familiarize him with where and how the pertinent information is filed and perhaps one more day on surplus equipment I consider I have done all the damage I can. To say the least, it has been an interesting, if sometimes frustrating several months. However I am satisfied that Union Carbide obligations have been successfully accomplished.

If I can be of any help in the future please don't hesitate to call on me.

Let's hope we can get together on a social basis one of these days.

Sincerely,

D. J. Hansen

/mau  
Attachment

cc: Messrs:  
✓ J. F. Frost  
T. J. Kagetsu

UCCNHT0000094

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  - 2.1 PCB Transformers and Capacitors
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  - 2.5 Asbestos in Freight Elevator
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- 4.0 OTHER ACTIVITIES
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  - 4.2 Asbestos Removal
- 5.0 CONCLUSION

## 1.0 INTRODUCTION

The Technology Department of Umetco Minerals Corporation was disbanded on March 31, 1985. Many items associated with the closing extended well beyond that date. These included transfer and sale of equipment, disposal of chemicals, termination of radioactive material licenses, reorganizing files, and withdrawal from the Elkem premises.

When Union Carbide subsequently sold the Niagara Plant to Strategic Minerals Corporation an Environmental Agreement was signed on May 13, 1986 in which liabilities were defined and certain reclamation, restoration, and disposal obligations were innumarated.

This report briefly summarizes the work completed in both of these areas. Details are contained in separate files which are presently located in Niagara Falls.

## 2.0 ENVIRONMENTAL ISSUES (NIAGARA FALLS)

Article 3 "Other Environmental Matters" - sections (a) through (l) of the Environmental Agreement (Niagara Falls) between Union Carbide and Strategic Minerals Corporation lists the obligations of Umetco to U. S. Vanadium.

One of these, (Item j), concerns vanadium slags and remelts and is the responsibility of U. S. Vanadium. Item k, dealing with the underground storage tanks is ongoing. U. S. Vanadium has signed letters acknowledging that 7 of the 10 remaining items were completed to their satisfaction. I have been assured that sign-off on another two, Item (a) PCB Transformers and Item (e) Asbestos in Freight Elevator will take place soon. The last one, Item (b) Halide Scrubber will be signed off after the stack discharge permit has been obtained.

More specific information on each of the items follows.

### 2.1 PCB Transformers and Capacitors

Eight transformers and in excess of 100 capacitors that contained PCB's were disposed of in May 1986 under the direction of U. S. Vanadium personnel. At that time, six transformers belonging to U. S. Vanadium and three belonging to Linde Division were retrofilled by UNISON. One of the transformers of U. S. Vanadium is a spare and could not be placed in service for the 90-days required prior to analysis and reclassification. Another failed to come to the required 50°C temperature. Mr. Gary R. Pilcher, Regional Service Manager of UNISON, has written to C. T. Wentzel agreeing to assume responsibility for reclassification at no cost to U. S. Vanadium or Umetco. A letter requesting sign-off was sent to C. T. Wentzel on January 19, 1987. I spoke with him by phone on February 17 at which time he assured me that he saw no problem.

### 2.2 Halide Scrubber

Prior to the sale, returned vanadium halide cylinders were cleaned in the yard and discharged to a sewer. In October 1985 a scheme was proposed to discharge the cylinders to a trough containing water jets that would direct the fumes to an improved scrubber. The cost was estimated to be \$70,000. In October 1986, the completed system in which costs had escalated to \$95,000

was found inadequate. It was necessary to extend a shed so that tanks could be discharged out of the wind. Additional capital was authorized by Mr. F. V. McMillen on October 10, 1986 with a stipulation that Umetco would not pay more than \$118,500. Modifications were completed and the system operated successfully on January 7, 1987.

A letter requesting "sign-off" was written to C. T. Wentzel on January 14. He sent a letter to Messrs. DeAtley and Miller on February 13 informing them that applications for air permits had been mailed to New York State D.E.C. It is my understanding they will sign-off when the permits are obtained.

### 2.3 Chrome Oxide

Fifty-one drums containing approximately 11 tons of vanadium bearing slag that had been contaminated with chrome oxide was disposed of by Chemical Waste Management (SCA Chemical Services) on April 10 and 11, 1986. A copy of the letter acknowledging that U. S. Vanadium was satisfied was mailed to F. V. McMillen on October 27, 1986.

### 2.4 High Antimony Tungsten

On April 2, 1986, approximately 50 tons of tungsten molybdenum oxide contaminated with antimony was disposed of by Chemical Waste Management (SCA Chemical Services). A copy of the letter acknowledging U. S. Vanadium "sign-off" was mailed to F. V. McMillen on October 27, 1986.

### 2.5 Asbestos in Freight Elevator

By the terms of the Environmental Agreement, UCC has "no indemnification obligation to Buyer with respect to --- (iii) any asbestos in the Niagara Falls Facility except as specifically enumerated in paragraph (e) of Article 3--". Paragraph (e) refers only to the removal of the asbestos lining in the Globar elevator. The Union Carbide Corporate Audit Team agreed that asbestos should also be removed from the Old Boiler House, pipelines outside the Old Boiler House, and Building 111 which were not part of the sale to Stratcor. This was an insurance against potential future liability.

The successful bidder was Niagara Insulations, Inc. at \$61,800.

Removal of asbestos from the elevator turned out to be much more complex than anticipated. Niagara Insulations elected to use a high pressure water jet. Unfortunately it was only partially effective and also caused asbestos to be forced through the joints in the corrugated steel walls resulting in contamination outside the elevator. Not only did the job take longer than expected but Niagara Insulations personnel had to be brought back on three occasions because the job was not completed to our satisfaction. The water treatment also removed lubrication from the elevator cable and pulleys and it was necessary to bring in Otis Elevator Company to correct this. However, on the plus side lubricating the cables also served to immobilize any fibers that may have been worked into the cable strands.

The atmosphere within the elevator was sampled by Asteco, Inc. on October 7, 1986 and again on December 11, 1986 to determine the extent of

airborn fibers. On both dates the readings were below the .01 fibers per cubic ft. recommended as satisfactory after cleanup by EPA.<sup>(1)</sup>

A letter was sent to C. T. Wentzel December 16 requesting sign-off. However U. S. Vanadium was not satisfied and resampled on February 11, 1987. This time no fibers were found in the sample. C. T. Wentzel told me by phone on February 17 that U. S. Vanadium will sign-off when he receives the written report from Asteco Inc.

## 2.6 "Super Sucker" Dust

"Super Sucker" dust is the material collected by a commercial vacuum cleaner from the rafters at various locations within the Niagara Plant. The contents of the machines are discharged randomly in the yard east of No. 5 Furnace Room. Various piles of this material were sampled by George Parker of U. S. Vanadium and analyzed by Ecology and Environment Inc. in May 1986 for leachable toxic substances. None were found which technically let us off the hook. However, it was decided to remove these materials to a sanitary land fill to avoid any questions in the future. Modern Disposal Services took care of this on August 11, 1986. U. S. Vanadium's letter of acceptance was mailed to F. V. McMillen on October 27, 1986.

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Over the years samples of raw materials, slags and ferroalloys were collected, placed in one quart tins and stored in a caged area in Building 25. Disposal of these presented a problem since the contents had to be identified and then classified as toxic or non-toxic. In addition, numerous samples, notably those from pyrocholors and uranium ores were radioactive. The disposal was begun under the direction of George Parker of U. S. Vanadium and a shipment of non-hazardous material was removed by BFI Waste System in 1985. We assumed responsibility for the remaining 1200 samples in July 1986. There were classified as radioactive, non-hazardous, or toxic and were handled accordingly. The radioactive material was included in a shipment to Barnwell, South Carolina, September 19, 1986. The balance of the samples, after classification, were emptied into 50 gallon drums. The non-toxics were removed by BFI Waste Systems on October 10, 1986, the toxic material by SCA Chemical Services on November 24, 1986. The storage area was thoroughly cleaned and monitored to be assured no radioactive material remained. A letter of acceptance by U. S. Vanadium was mailed to P. K. Willmott on January 14, 1987.

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A radiation survey and surface sampling were completed in the yard area east and north of the Niagara Plant. The purpose was to determine if hazardous waste was present in this area, in which case Umetco would assume the cost of reclamation, or if not, the surveys could serve as a benchmark for deciding reclamation costs at the termination of U. S. Vanadium operations at Niagara Falls.

(1) The Department of Labor (OSHA) as of June 20, 1986 will allow 0.2 fibers per cc but requires medical surveillance at 0.1 fibers per cc. The regulation for permissible airborne fibers in the workplace are an order of magnitude higher than that suggested by EPA after cleanup.



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U. S. Vanadium signed off on this item in October 1986.

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A gamma radiation survey completed in February 1986 uncovered three areas within the plant that had radiation significantly above background. These were an area immediately adjacent to No. 30 Furnace in Building 29, a pit in Building 24 (VA1), and a slag pile east of Building 29. This discovery caused some concern because we had been actively trying to terminate our radioactive material licenses for over a year. Mr. R. Kelly of the State of New York - Department of Labor, was informed and later met with Bob Beverly and me to decide on the proper course of action.

We discovered that New York State is more lenient than NRC on defining allowable concentrations of natural occurring radioactivity (500  $\mu\text{g/g}$  of combined U + Th and radiation less than 250  $\mu\text{R}$  at surface). The contaminated millenite in the pit in Building 24 and the slag in the yard area contained less than this limit. However, Dr. F. J. Bradley, Principle Radiophysicist of the New York Department of Labor suggested it would be wise to remove the material to a waste site to avoid riders on the lease of the property.

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U. S. Vanadium signed the letter of acknowledgement in October 1986.

## 2.10 Drain and Level Lake

A low area east of the Niagara Plant on the property line between L-Tec and U. S. Vanadium collected rain water and discharge from L-Tec forming a sizeable artificial pond sometimes referred to as "Lake Linde". After consultation between personnel from Linde, L-Tec, and Umetco it was decided to take remedial action. The north end of the pond was drained by L-Tec in April 1986.

The final draining and grading was completed by Dube Construction on August 22, 1986. Several truckloads of clay from Elkem property was used as fill. This material had been used as a temporary cap over an area that had been excavated to remove radioactive soil. Samples of the clay were obtained by Advanced Environmental Systems and analyzed for leachable EP Toxicity Metals. The samples were then forwarded to the Linde Division R&D Analytical Services for radio-assays. There were no leachable toxic metals and the radioactivity was barely above background.

Polaroid snapshots of the graded area were submitted as part of the record.

U. S. Vanadium signed off on this item in October 1986.

### 3.0 CLOSING OF THE TECHNOLOGY DEPARTMENT

#### 3.1 Transfer and Sale of Equipment and Furniture

When the disbanding of the Technology Department was announced all the laboratory equipment at Niagara Falls (and Grand Junction) became surplus. The equipment lists that had been prepared for the "Tiger" project were circulated to the Niagara, Hot Springs and Bishop Plants. Equipment was shipped on request on a "first come - first served" basis. The Hot Springs Plant was the most aggressive receiving about 90% of the Grand Junction analytical laboratory equipment plus two large shipments from Niagara Falls.

The balance of the sale was placed in the hands of Investment Recovery. Their first order of priority was to offer surplus equipment to other divisions of Union Carbide. Roy Sommers visited the Technology facility and prepared a booklet listing those items he thought would move quickly. Closing Date for request was set as October 15, 1985.

The response within the Corporation was good. Eighteen locations made requests and equipment with an initial value of \$139,852 was transferred.

Elkem Metals was given first choice when sales were opened up outside the Corporation. They purchased considerable equipment to which was assigned an \$11,190 price tag.

The choice office furniture, i.e. that constructed of wood, both from R&D and Engineering went to the Linde Divisions located next door.

Most of the equipment and furniture remaining was moved to the vacant "Old Works Lab", (Building 111) prior to the termination of our lease with Elkem December 31, 1985. Some of the heavier pieces were stored in garages near the Engineering Building. Furniture and partitions from Engineering (Building 149) were also stored in Building 11 when that facility was turned over to Linde Division.

Investment Recovery invited several used equipment dealers to bid on what was left. Representatives from two firms, BoChem and J. Little Mercer sent representatives to view the equipment. BoChem submitted a bid of \$1750 which was turned down.

On February of 1986 an inventory of what was available, including the contents of the more than 241 cartons used in moving, was compiled and sent to Investment Recovery. They sent the list out again inviting bids for a "as is, where is" package. Polyscience, Inc. made an offer of \$6800 which was accepted on May 19, 1986 by Investment Recovery. This offer was subsequently withdrawn.

J. Little Mercer Company made a revised bid of \$10,000 in June 1986 but when they found out that Polyscience had dropped out of the bidding they withdrew their offer.

We then began to sell small orders of equipment to small local firms and some furniture to individuals. There were approximately 21 transactions with total sales amounting to \$7,410.

The contents of the garage were sold for scrap in February 1987 because U. S. Vanadium wanted use of the area. Ownership of Building 111 remains with Union Carbide; Linde Gas Products will act as caretaker. To the best of my knowledge Investment Recovery will leave the equipment in Building 111 until it becomes necessary to dispose of it all.

### 3.2 Vacating Elkem Buildings

Building 169 housed the Carvan Shaft Furnace, the Rotolouvre Dryer (Asbestos Plant), the Pilot Heap Leach, as well as some small scale laboratory equipment. When the decision was made to retain the shaft furnace, Jack Zasler was hired as a consultant to supervise its dismantling and transfer to the Niagara Plant. The Asbestos Pilot Plant was dismantled and components sold or scrapped. Scrufari Construction Company performed the work under Jack's supervision. Asteco Inc. was retained to obtain air samples to assure that asbestos fibers was not rendered airborne during the disassembly. Building 169 was thoroughly cleaned to the satisfaction of Elkem personnel before vacating. The dismantling costs were estimated to be \$15,000 plus \$12,000 for Investment Recovery's role.

The equipment and furniture in Buildings 166 and 94 were moved to Building 111 in November and December of 1985 by Kuhns Moving and Storage Company. The total moving cost was about \$16,000.

### 3.3 Disposal of Chemicals

It was customary for each laboratory within the Niagara Falls complex to have a stock of chemicals. To simplify disposal, the chemicals in each of the labs were collected in two central locations - one for inorganics and one for organics. They were then grouped according to element or compound and a comprehensive listing was prepared. There were in excess of 2500 items. A copy of the list was sent out to the Umetco Plants and to Elkem to see if they had use for any of these chemicals. Elkem, the only respondent, took about 100 items.

SCA Chemicals, with whom Union Carbide had a national contract, handled the packaging and disposal of the balance. Tracking down the composition of the numerous organic chemicals used in mineral dressing proved quite challenging. The disposal costs were approximately \$15,000; probably a bargain considering the time SCA personnel had to spend on this job.

In April of 1986 additional mineral dressing chemicals that were stored in Building 99 and had been overlooked were disposed of at an additional cost of \$3,700.

### 3.4 Termination of Radioactive Material Licenses

The Niagara Complex had acquired three radioactive material licenses. License No. 955-0139 for a radioactive source for a density gauge and No. 950-0139 to allow processing of columbium ores were assigned to the plant. License No. 210-0090, assigned to Technology, was for several radioactive sources.

#### 3.4.1 License No. 955-0139

This license was for one (1) 150 mCi Cs 137 source used in an Ohmart density gauge to measure the specific gravity of calcium hydroxide sludge in a pipe. It was granted in February 1965; it was amended 10 times, the most recent being October 1981. The source was sent back to the manufacturer by George Parker in August 1985. License termination was granted on September 4, 1986.

#### 3.4.2 License No. 950-0139

The original license was issued to Olefins and Metals Division of UCC in January 1965. The license superseded U. S. Atomic Energy Commission License No. SUB-469 which was terminated when jurisdiction passed from federal to state control. It was issued to cover the processing of ores and the storage of slags containing thorium and uranium used or generated in the production of ferrocolumbium.

Production of ferrocolumbium was discontinued about 1972, a letter requesting termination of the license was written to New York State by Mr. D. Brosnahan on March 11, 1982. However an earlier survey by DOE/MED indicated areas of above background radiation on Metals Division property behind Building 166. A subsequent survey by R. Kelly of New York State Department of Labor in April 1982 showed four areas to be out of compliance. The contaminated soil was removed over a period of two years. Samples taken on March 20, 1986 were found to be free of contamination and termination of the license was granted on August 15, 1986.

#### 3.4.3 License No. 210-0090

This license was issued to the Technology Department of Union Carbide Metals Company on November 28, 1962. It superseded AEC License No. 31-1069-2. At that time it covered four radioactive elements for use in radiochemical tracer studies. We have ten amendments on file, the last one dated May 11, 1982 which added a new Cobalt 57 Sealed Source.

A request was made to terminate this license on February 7, 1986. At that time the following sealed sources were included in the license: 2 Cesium 137, 1 (ea.) Cd 109, Fe 55, Co 57, and Pu 238. In addition, at that time, the Lab had on hand an unknown radium source, an alphasource, about 3-1/2 pounds of thorium chemicals, four fused thorium oxide

crucibles, and an Alnor dewpointer. A table, which was included in the request for termination, indicating the details of disposal is reproduced below. The license was terminated on August 15, 1986.

#### DISPOSAL OF RADIOACTIVE MATERIALS

<u>Radioactive Source</u>	<u>Disposal</u>	<u>Broker or Manufacturer</u>	<u>Packaged By</u>	<u>Carrier</u>	<u>Date</u>
(2) CS 137	Nuclear Res Warrington, PA	Accuray (Manufacturer)	C Kolodjeski (Accuray)	Smith Transfer	10/17/85
Alnor Dewpointer	Alnor Inst.Co. Skokie, IL (Manufacturer)		A Gonas (Umetco)	U P.S.	12/6/85
Cd 109 Co 57 Fe 55 Pu 238	Amersham (Manufacturer)		F Susterick (Amersham)	Federal Express	12/10/85
Thorium Oxide(1/2#) Nitrate(2#) Chloride(1#) (4) Thorium Crucibles - 3-1/2" x 1-3/4" Alphatron Gauge Radium Source	US Ecology Richland, WA	Chem Nuclear (Broker)	J Bender (Chem Nuclear)	Consolidated Freightways	12/31/85

#### 3.5 Technology Files

At the time of the sale of the ferroalloy related business to Elkem in 1981 the Technology Files were split along product lines. The Metals Division continued to use the same file room and shared the part time services of Mrs. Florence Englander, an experienced file clerk. Unfortunately the files were not complete - primarily because incoming correspondence, reports, etc., were in most cases not forwarded for filing. Most of this information was buried in individual's personal files. Again, unfortunately, these were never sorted when personnel were retired, transferred or terminated.

The Technology Files, both from Niagara Falls and Grand Junction, together with numerous personal files that remained were physically transferred to the Niagara Plant prior to December 31, 1985. Over the next several months these were culled, sorted, and indexed. The uranium files (19 boxes) were shipped to Grand Junction on August 14, 1986.

The remaining files on vanadium, tungsten, and numerous other topics were sorted and turned over to U.S. Vanadium in October 1986. Copies of the Technology Files Index together with a letter listing the contents of the other files was mailed to appropriate Umetco personnel on October 30, 1986.

The patent files, including the dockets dealing with uranium are located in the same room.

### 3.6 Decontamination and Restoration of Elkem Site

Personnel from ORNL and DOE surveyed the Technology Site in August of 1976 because this property had housed uranium metal production in 1942. Above background beta-gamma readings were found behind Building 166. Subsequent aerial radiological surveys in 1978 and 1979 showed no anomalies on the Union Carbide site. In September 1980, ORNL personnel conducted a follow-up radiological survey and found relatively high concentrations of the gamma-emitting radionuclides of the thorium 232 and uranium 238 decay chains in the surface soil around Building 166 and 163. It was concluded, based on U-238 and Ra-226 ratios, that the contamination was from thorium bearing ores and not uranium metal. It was recommended a more comprehensive survey be completed.

A preliminary radiation survey was conducted by Dave Brosnahan in October 1981 which showed high concentrations along the railroad tracks behind Building 166.

On December 7, 1981, UCC was cited for being in violation of the New York Radioactive Materials License 950-0139. Concentrations of source material exceeded limits specified for uncontrolled areas.

A comprehensive radiation survey was then undertaken by Lee Evans and Dave Brosnahan and a Design Memo "Radiological Survey, Cleanup Options and Cost Estimates" was released by Lee Evans on July 13, 1983. The decision was made to proceed with the most expensive option (\$335M) which involved removal of soil and shipping it to a repository.

Excavation began in the summer of 1984 and shipments to both Uravan, Colorado for processing and Barnwell, South Carolina for burial continued until the end of the year.

The excavated area was backfilled with clay. [Elkem Metals objected to this step, complaining that the compacted clay would not yield a surface that would be satisfactory for storage or vehicle traffic.]

Analysis of samples, taken before excavation in July 1984, after excavation, and after backfilling in October 1984, at surface and depths of six and twelve inches, were forwarded to New York State in July 1985. The delay in analytical results was caused in part by the closing of the Grand Junction Analytical Lab. Later, samples had to be resubmitted when Alpha Nuclear in Dallas analyzed the incorrect thorium isotope.

Mr. Kelly, Department of Labor, obtained samples to verify cleanup on March 20, 1986. Notification that the license was terminated was received on August 15, 1986.

Dube Construction Company was awarded a contract (\$18,500) to restore the Elkem property. This consisted of excavating about one foot of the clay cap and backfilling with crushed stone.

Mr. Richard Crago, Site Manager of Elkem Metals, signed a letter on September 9, 1986 acknowledging that the restoration and delicensing was completed to their satisfaction. It was suggested a copy of this letter be placed in the Tiger Project Files. Polaroid snapshots of the job at completion are retained in the file here at Niagara Falls.

#### 4.0 OTHER ACTIVITIES

##### 4.1 Removal of Boiler Room Stacks

Union Carbide elected to retain the old boiler room complex as insurance when Occidental Petroleum began to provide steam to the Niagara Complex. This facility was retained when surrounding buildings were sold to Niacet in 1981. The age and condition of the boilers precluded further use and the two stacks presented a safety problem. The stacks were taken down by Scrufari Construction Company July 22 through July 24, 1986 at a cost of about \$4400. This included an overrun of about \$2000, the cost of bringing in a heavier crane which was necessary when the stacks were found to be double walled and filled with insulation. The double wall caused additional problems for the scrap dealer selected for the disposal. It became too expensive for him to cut the stacks into small enough sections for him to be able to mount the pieces on his trucks. To avoid the liability of stacks lying on Niacet property, Scrufari Construction was commissioned by us to assist in the removal. This was accomplished on February 11, 1987. The cost was approximately \$1000.

##### 4.2 Asbestos Removal

The boilers and associated piping of the Old Boiler House were insulated with asbestos. The insulation on the six pipes that ran for approximately 800 feet on a pipe rack was in sad condition. In addition, asbestos insulation was found on steam lines within Building 111. The decision was made to remove this material for environmental and safety considerations. This work was included in the contract awarded to Niagara Insulation in August 1986.

#### 5.0 CONCLUSION

This report contains an overview of the tasks involved when a major facility is closed and sold. It is meant only to be a summary which could lead somebody interested in more detail to the proper files.